No.38

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1980

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COVER PIC BY JOE RICHELIEU
Lovely Jane Thornton admires a new prototype Sawtron CB radio from Imark P/L. Details of the new rig will be announced later in the year.

MOBILE ONE

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ON CHANNEL

WITH KEN REYNOLDS

With the 1982 11 metre disbandment deadline looming even closer it is understandable that a noticeable atmosphere of uneasiness is gradually creeping into the national CB scene. Last year, operators were obviously taking the threat much more lightly than the present increasing tension indicates and it appears that more and more CBers are contemplating their future HF prospects in all seriousness.

It is also understandable that during a period of future uncertainty and possible crisis there will evolve numerous rumours – most with little credence and others which on the surface appear feasible but are not based on fact.

I would briefly like to discuss the subject of rumours this month and lay waste to one particular fabrication which is gaining momentum around the bands.

The originator of this rumour has cleverly offered the listener built-in credibility by involving one of the world's most highly respected research and development operations, namely the CSIRO. The fact that the CSIRO has a proven record as Australia's number one scientific problem solver serves to reinforce a story which soars high in the realm of improbability.

The tale as I had it imparted to me recently goes something like this: "have you heard that P & T have commissioned the CSIRO to develop a transmitter which will completely jam out all 27 megs CB channels in 1982? They intend to transmit the jamming signal along all mains power transmission lines throughout Australia for a few years until everybody gives up trying."

You can well imagine where this rumour might end given a little added exageration to colour it along.

At first thought the story might even appear to 'hold water', however, when considered at greater length there are a number of technical loop-holes which in this case rear their endearing heads. . .bless their little cotton socks!

Assuming that a transmitter of immense power was coupled into the power transmission system in each state with its impedance matched to the power lines, it stands a fair chance of destroying CB communicationsIf we ignore a few shattering facts.

The secret here is impedance matching to the power lines whereby the jamming signal would circulate, happily destroying CBRS HF operations by a metered amount of leakage which would undoubtedly be sufficient to justify the technique of expenditure if any Government could become paranoid enough to seek such absurd retribution. It's not likely that any would but just suppose for a moment someone wanted to try.

Sounds like it might just be the answer to an aunty PAT's prayer. . .

Well you can safely forget it!

Electric power transmission lines suffer from one main failing . . . they aren't very efficient and over a long distance span large voltage drops occur requiring that thousands of high voltage transformers be installed and dotted all over the countryside, especially in areas of greatest power consumption – city and suburban areas. In one fell swoop the master plan is destroyed far beyond reconciliation.

The transformers operate beautifully at 'mains frequency' which is faithfully held to a line frequency of 50 hertz. They may even operate at medium audio frequencies. . .that's one hell of a speaker transformer. . . but their inductance is such that the thought of one passing a 10 MHz signal is quite ludicrous – not to even consider HF CB frequencies.

What then would be the result? A jamming frequency would be stopped dead in its tracks by the first transformer station it encountered.

The answer?

Thousands of transmitters of course.

They might even bypass each transformer with a suitable special 'one off' capacitor. Consider the manufacture, development and installation costs.

The project on a national basis would cost many millions of dollars to implement and probably as many more to 'de bug' the problems. Now answer me this – is any couple of hundred kilohertz of spectrum space worth that much to any living being?

There are many other well founded scientific reasons why this idea is impractical – and to continue here listing them would be as absurd as the rumour which prompted me to write.

Poof goes another rumour! C B A

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TOMORROW WILL BE TOO LATE – FIGHT FOR THE C.B. AND FIGHT FOR JUSTICE.

Mobile One supports the retention of 27MHz C.B.

TURN TO PAGE 23 AND DO YOUR SUBMISSION NOW!!

LOG BOOK

P-DAY

Rallies were held throughout Australia on 'P-Day' (29/3/80) protesting against the proposed discontinuation of 27 MHz CB after 1982.

The Melbourne rally drew about 500 local CBers who drove in convoy from Chadstone Shopping Centre to P & T's South Melbourne offices.

A cheque for $5,000,-000 was torn up by the multitude at South Melbourne.

Organisers said they were disappointed with the lack of attendance by the Melbourne press but still felt that the rally had presented the case for retention of this important band.

Photos on this page show some of action in Melbourne.

CB ACTION is gathering information on rallies in other states and areas which will be presented next issue.

Deadline for this issue was on the day before 'P-Day' but copy was held over so we could include these photos.

CREST ART UNION DRAWN

CB ACTION received the following information regarding the first CREST Art Union drawn on15/3/80 under police supervision.

1st Prize: Ticket No. 5993, R. L. Symes — Balgowla Heights, NSW

1st Prize: TOYOTA CORONA.

2nd Prize: Ticket No. 37962, N. McDonald, Eden NSW

2nd Prize: ALUMINIUM JET BOAT

3rd Prize: Ticket No. 19410, T. Leffers, Fisher.

3rd Prize: HONDA XL250S MOTOR CYCLE.

4th Prize: Ticket No. 3543, T. Hokin, Cessnock, NSW.

4th Prize: PHILIPS VIDEO CASSETTE RECORDER.

Ten prizes of Philips Radio Cassettes:
Numbers — 197, 5686, 11228, 17357, 41422, 30452, 35222, 35262. 39508, 17587.

Ten prizes of Philips Portable Radios:
Numbers — 37, 2282, 2441, 2914, 2928, 2995, 7278, 9824, 24481, 24551.

Fifty prizes of Philips Pocket Radios:
Numbers — 302, 589, 815, 1487, 1513, 1561, 1681, 1844, 2007, 2841, 2901, 3289, 3731, 3821, 3957, 4662, 5236, 6232, 7081, 7951, 9752, 10137, 11080, 11371, 18568, 19531, 19568, 19693, 19782, 20238, 20307, 20401, 24191, 24172, 24461, 26925, 28136, 29214, 30685, 32061, 34423, 34721, 37601, 38542, 38991, 39045, 39290, 39413, 39854.

UK HAMS HARASSED

The battle for CB recognition continues to rage in England.

Our man in London reports that licensed radio hams in the London and Essex areas are complaining of harassement by the police, who are said to be conducting an intensive campaign to catch illegal CB radio users.

After a recent meeting of the Citizen Bands Association, members protested to the police about the treatment. The CBA is pressing for the legalisation of CB radio.

One member claimed that several people have been taken to police stations and detained in the belief that the radio sets in their cars were CB, while there were in fact licensed mobile radios.

"The police are stopping anyone with an odd looking aerial. If they have arrested any illegal users I would be delighted, but I don't think they will, and the way they are going about it at the moment is completely negative," the member claimed.

Meanwhile, the Greater London Council is trying to discover the views of London residents on CB radio by issuing a consultation paper.

About 5,000 of the papers will be distributed, informing people of the issues raised by CB and asking them to send the council their views by June 4.

continued on page 8.

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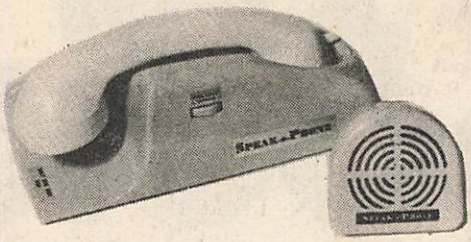

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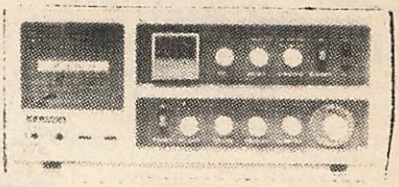

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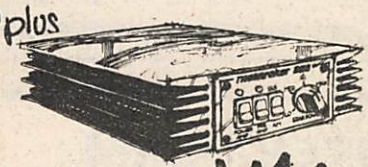

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LOG BOOK

MISS CB ACTION 1980

The staff at CB ACTION have picked the winner of the Miss CB ACTION Quest 1980 but in true lecherous form, have decided to hold over the announcement until the next issue. We're sure you won't be disappointed in our choice.

CB SAVES (ANOTHER) LIFE

CB radio saved yet another life according to the Melbourne Sun newspaper (24/3/80).

Alan Mander survived for four days 65 km north of Broome in WA after becoming stranded.

Alan's call for help was picked up by an Adelaide operator who notified the police.

CB ACTION heard that Alan's call for help had been picked up prior to the call which led to his rescue but police had ignored them, apparently believing they were hoax calls.

Luckily, all's well that ends well but this might not have worked out if the police had continued to believe it was a hoax.

2400-km CB call brings help

A STRANDED man was rescued from rugged bush after a CB operator more than 2400 km away picked up his calls for help.

By DAN McDONNELL

Alan Mander, 28, had tried for four days to get help with his CB radio.

An Adelaide operator finally picked up his call from Quondon Point, about 65 km north of Broome, WA, and alerted police.

Mr Mander's call got through on Friday. Police found him in his hopelessly bogged panel van on Saturday.

He said yesterday he had managed to contact someone in NSW on the CB on Wednesday. They had put him on to the Darwin CB Emergency Service — "but I could only speak to them for a few minutes before they faded and I couldn't give them enough details."

Mander said he tried to walk towards Broome on Wednesday, but came back to his van after a storm raced through the camp he had set up on a road about 20 km from the car.

He said he sat in his car wondering whether he was going to die.

"I thought at one stage I wouldn't make it out at all," Mr Mander said.

"I tried to dig out, but I just couldn't get out."

The temperature in his car reached 48 C during the day.

At one stage he put his spare tyre out on a hill ready to light it if he saw a plane.

"On Thursday afternoon I went to a main road about 5 km away and set up a road block with a sign saying: 'Please help. Out food and water. Approximately 5 km away'" he said.

Mr Mander who has been the feeling of hearing approaching police cars as "bloody beautiful."

"I was quite weak. I think I'd walked about 50 km all together and I could hardly stand up.

"I thought my number was up for a while there."

Mander, who has been living at a Broome caravan park comes from Ipswich, near Brisbane, in Queensland but has been travelling around Australia for two years.

SYDNEY PIRATE FINED $1000

An unlicensed radio operator in Sydney was recently fined over $1,000.

He was fined $25 each on two charges of unlicensed operation and one of using obscene language — total $75 — plus a further $932.21 in costs. He also had his equipment confiscated.

It is believed he was operating on the 27 MHz CB band.

Many unlicensed operators are worried that this case will be used as a precedent and the days of $60 fines with $20 costs could be in the past. C B A

CLUB REGISTER FORM

If you wish to have your club name listed in the CB ACTION Club Register, please ask your club secretary to fill in this coupon and post to "CB ACTION CLUB REGISTER, Box 628E, GPO, Melbourne, Victoria, 3001."

Due to printing deadlines, it is possible for new entries to take up to two issues before appearing. If you don't want to cut your copy of CB ACTION magazine, either photostat the coupon or send your entry in on a separate letter giving all the relevant details.

Overseas entries are welcome.

Please print or type — applications that are either illegible or not completely filled out may not be included in the listing.

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..... Sec

FULL CLUB NAME.....

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ADDRESS.....

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P/CODE.....**STATE**.....

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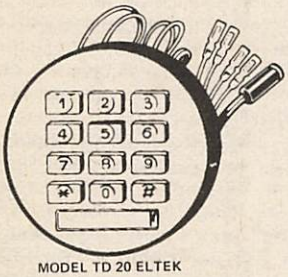

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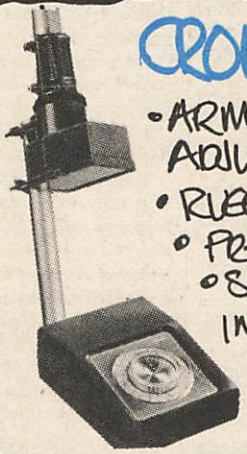

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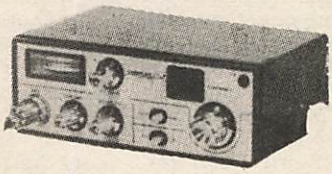

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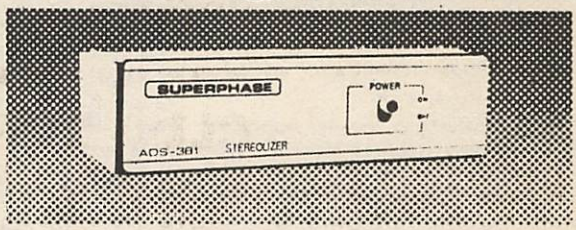

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QUEENSLAND

by Rod Fewster

I've had quite a few calls and letters to Queensland Scene about mail-order ripoffs, and I guess CB ACTION has received many more.

How about all you CBers who have been dudded putting pen to paper and letting me know the details? I'd like to compile a list of shonky CB dealers. CB ACTION may not be able to publish it without being sued for libel, but there are plenty of other ways of spreading the word, and I know them all. Bear in mind that a lot of mail goes astray (much more than Australia Post will ever admit) and that cash sent through the post cannot be traced if sent by ordinary mail.

What I want is hard evidence such as cashed cheques, money orders, etc. Don't be afraid to write. All names and addresses will be kept confidential, particularly where illegal equipment is involved.

I couldn't care less whether you're a Superpirate or a Good Buddy, if you've been ripped off, let me know. It's about time some of these birds had their wings clipped. You might even get your money back, but even if you don't you'll be helping to improve things for other CBers and reputable mail-order companies as well as helping to ruin the reputations of the shonkies.

★ ★ ★

A few months ago trawler operators in Moreton Bay decided they'd "take over" channel 1 for their own exclusive use, and ever since some of them have been abusing the living daylights out of anyone else who dared to try to use the channel. This has naturally got right up the noses of some of the Brisbane CBers, and many of them make it a point to use Channel 1 as much as possible.

"Breaker, breaker, is this the Prawn Channel, Good Buddy," and "All prawn trawlers should be torpedoes on sight," will be familiar to anyone who's tried to use the channel recently.

By the time you read this column the Big Guns will have been fired. Brisbane ACREM has a CBathon planned in conjunction with the Easter BTQ-7 Children's Hospital Appeal telethon, and they'll be transmitting from BTQ-7's Mount Coot-tha studios ON CHANNEL 1.

If the trawler operators don't back off and give the CBathon a fair go they deserve to be torpedoed on sight!!!

CBer living in one of the Bayside suburbs wonders how the prawnies manage to find the time to abuse other people. He reckons most of them obviously spend their spare time abusing themselves.

★ ★ ★

Here's a bit of Aussie history you won't find in your schoolbooks.

Ken, one of my regular sources of info from down Sydney way, sent me a copy of a Statutory Declaration which was made by Lieutenant R.W. Miller, RAN, stating that the ONLY contact HMAS Coonawarra had with the rest of the world when Cyclone Tracy wrecked Darwin back in 1974 was via a 27 MHz CB lent to the base by John Tate, an old Darwin pirate.

After the initial emergency was over and other forms of communication had been re-established, John relayed messages from Darwin residents to relatives around Australia with the help of pirate operators in other parts of the country.

I've been told that this episode was branded as hogwash by the Radio Branch, who claimed that an amateur transceiver was used. I wasn't in Australia at the time, but I recall NBC News saying that hams world-wide were assisting with emergency communications. No doubt they were, but so were a lot of pirates, and now I've seen the evidence to prove it.

Seems that John never did receive recognition from any Government body for sticking his neck out and risking prosecution to help others, probably because he was a pirate, (Boo!! Hiss!! Undesirable element!! Socially decadent!!), but the gratitude of the people of Darwin more than made up for this.

Australia needs more people like you, John, and less like the Government wankers who didn't have the decency to say "Thanks."

★ ★ ★

Very strong rumour doing the rounds in Brisbane claims that the dreaded RIs have a machine all set to fire up on July 1st 1982 which will totally blot out the whole of 26 MHz and 27 MHz, thus preventing anyone from using 11 metre CB equipment (even the two hundred channel boys) and forcing everyone either up to 476 MHz or off-the-air. Shades of the Russian Woodpecker.

Apart from contravening a heap of international treaties and bringing the wrath of the regulatory authorities of the whole world down on their heads, this action by the RIs would only drive the 27 meggers up or down a meg or two. (Those who aren't there already, that is). The RI's know only too well just how easily CB transceivers can be made to perform the odd miracle.

Personally I can't see why anybody with any intelligence at all would even give a tale like this a second thought, let alone repeat it on-air until it gained the status of "fact." Take it from me, it's just not on.

As my old mate Blue would say, "What bloody codswallop!!"

★ ★ ★

It looks like 27 MHz isn't the only spot on the dial where you can find a bit of stirring. I've just spent a month more-or-less confined to the house, and I filled in a lot of the time by listening in to the ham bands.

Seems that some hams take exception to "nets", and several times I heard one character playing one of those crazy laughing machines on-air while a net was in progress. Another guy calls net participants "Certificate Cheats," and in some cases he's right on the button.

I've heard that the ARRL is cracking down on the old traditional "relayed QSL info" method of cheating by having nets monitored from time to time by trustworthy ARRL officers, but some of the more unscrupulous paper-chasers have figured a way around this. It's quite obvious if you have a suspicious mind like mine, but they seem to be getting away with it.

At least I haven't heard any fair-minded hams break in and tell these coots that they're not playing the game properly, as used to happen with the old "relayed information" tricks.

Myself, I like to talk to people. Swapping reports and confirming them with cards simply to obtain a scrap of paper saying you've "worked" seventeen million stations within three inches of the Bermuda Triangle or wherever seems pointless to me. I guess you could work every station in the world on that basis and not say more than twenty words to any of the operators.

As I heard one gravel-voiced old Stateside ham say recently, "What the hell ever hapened to ham radio? We used to talk. Now we just throw numbers at one another."

★ ★ ★

If you have any news or comments which may interest Queensland readers, drop a line to:

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Don't forget to send details of mail-order ripoffs if you've been dudded.

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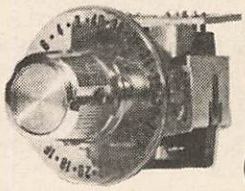

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QSL SWAPPING NEWS

For some time now I have been greatly concerned about the large amount of pornographic cards coming into this country. Don't get me wrong, I'm no puritan, but really, some of these cards are enough to turn your stomach.

These sicko, twisted, mindless freaks get their jollies by sending this type of card out and really get off when you tell them what to do with their cards.

One club in America that condones this perversion is DOM (Dirty Old Man) and its counterpart DOL (Dirty Old Lady). The names of the clubs speak for themselves, and personally I find their smutty garbage totally offensive.

I recently received cards from the president of this club which I returned and told him to go and see a shrink. He replied suggesting I was queer and we all know that isn't true. Don't we, Cheekys?

Seriously there are lots of young people becoming involved in QSL collecting and I'm sure their parents would be horrified to see cards like this in their collections. May I suggest that if you receive a card that offends you, take it to your local Postmaster, with the sender's name and address and he will arrange an investigation in the country of origin.

My choice for BAD TASTE CLUB OF THE CENTURY?

D.O.M. & D.O.L.! Who Else?

I feel it is time to mention hand writing again as I have received a few letters recently, similar to the following from a QSL'er in Oklahoma, U.S.A.

"We have a problem with a lot of the cards from Australia! We just can't make out the address or names on them as they are written (scribbled?) and very hard to read".

A number of issues ago I mentioned chain letters and how they just don't work. This month I would like to show you a chain letter with a difference, sent in by The Raccoon, 78 Hudsondale Street, Weatherly, Pennsylvania, U.S.A.

This chain letter was started with the hope of bringing relief and happiness to all tired husbands.

Unlike most chain letters, this does not cost money.

Simply send a copy of this letter to five of your married friends who are equally tired. Then bundle up your wife and send her to the man on top of the list, adding your name to the bottom of the list. When your name comes to the top of the list you will receive 16,487 women and some will be dandies. One man broke the chain and got his old lady back.

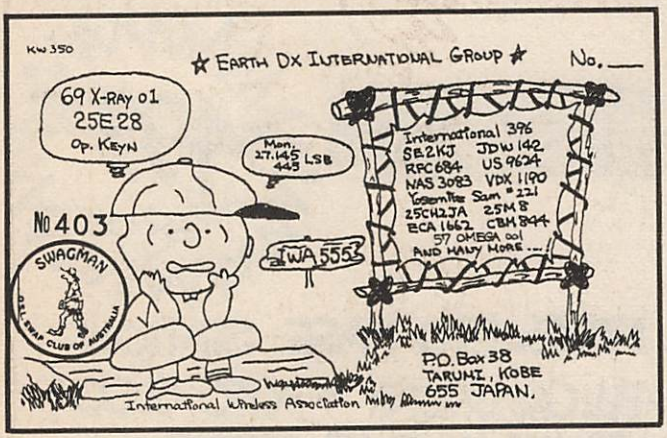
P.S. At the time of this writing, a friend of mine received 365 women. They buried him yesterday and it took seven undertakers thirty-six hours to get the smile off his face.

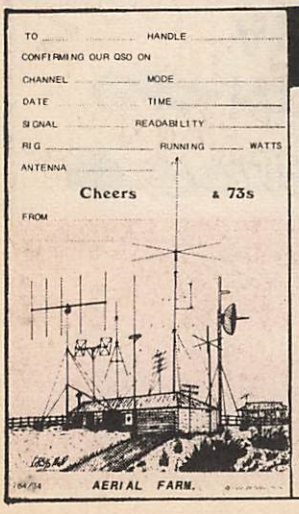
This month I also have a brief message for R.W.22 and R.W.44. Sit On It! I found a supplier of Australian and State Flags, and if anybody would like the address, just drop me a line.

Until next month, Good Luck with your QSLing . . . Collectively Speaking.

GARRY MOROSOFF.

C B A





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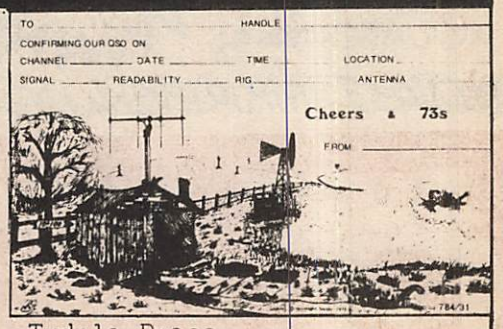

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"BACK TO YOU..."

Letters from readers are welcomed. They should be type-written and present an interesting viewpoint. Length should be around 500 words. The writer of the best letter each issue will receive a free 12 month subscription to CB Action.

REPLY FROM P & T

Your article entitled "The Constitutional Crisis! — 1980" in CB ACTION No 37 contains references to a number of matters and states that the situation in relation to CB Radio is in need of clarification.

There have at various times been proposals that Section 51 (v) of the Constitution should be revised to state more clearly the Commonwealth's power to make law for radio-communications. Advice has also been sought from the Attorney-General's Department when the Wireless Telegraphy Act has been under review to ensure the proposed legislation is covered by the powers granted under the Constitution.

In general terms, this advice has indicated that it is possible to expand the Commonwealth's control of radio beyond that contained in the present legislation without going beyond the existing constitutional framework. The present legislation is however regarded as sufficient for the legal control of Citizens Band Radio and other radio communications, although in certain other respects the Act is acknowledged to be in need of amendment.

The present policy with regard to the licensing and control of certain types of receiving apparatus is unrelated to the Constitutional questions raised in your article.

I would like to turn now to your feature "Debating the Issues" (CB ACTION No 37, Page 40) in which you point out that on the basis of the licences on issue at the end of March 1979 the CB licence fee revenue should have been $4,483,000 and not $2,525,770.

I must reiterate that the discrepancy between the actual licence fee revenue and the theoretical revenue at 30 June 1979 is due to the number of licences which, at the time, although classed as either unpaid renewals or pending cancellations, were still recorded as licence issues.

Due to the present limited information processing resources, it is normal practice for the Department to rate the issue of licences a higher priority than the cancellation of licences due to non-payment of renewal fees. There is also a planned delay in cancelling licences to allow for late payments.

The total effect of these factors at the end of the fiscal year 1978-79 was that some 72,000 licences were still technically on issue although the renewal fees had not been paid and the licensees would have been liable to prosecution if they had been detected operating.

Readers may be interested to know that the downward trend in the number of CB licences is continuing and the number of effective licences at the end of December last would have been in the order of 90,000 approximately a 50 per cent decrease on the figure at 31 March 1979.

P. D. BARNES
Acting Assistant Secretary
Post & Telecommunications Dept

We thank P & T for replying to our criticism so promptly. We disagree with your comment about the 'Constitutional Crisis' — as we knew we would — but as that issue requires at least a High Court decision, any further comments are superfluous. We agree to disagree.

On the licence fee fiasco, we will wait for the 'official' 79-80 figure before comment. However, we feel that the last paragraph is misleading.

Five rigs for one licence was instigated at the end of June 1979. As the hobbyiest CBer averages 2.5 rigs, we can see that the downturn mentioned by Mr Barnds is simply the combining of two or more radios onto one licence and does not indicate any lessening of the number of licensed operators.

Some sources indicate that there are some two million owners of CB radio equipment — though the vast majority would only be used occasionally for interstate or country trips. These people apparently feel that $25 per year is too much to pay for the casual use — mainly listening — and would prefer to throw out their equipment rather than pay the licence fees.

Likewise, many enthusiast operators feel that, until P & T give them something for their money, they will remain unlicensed as a protest. Editor.

WHO NEEDS TOWERS?

Support and enthusiasm for listening on the air waves can border on fanatacism on some occasions.

One such occasion occured recently when I was camping at Wedge Point, approximately 100 miles north of Perth, W.A.

Using a Philips FM 320 UHF can be very frustrating with the obvious limitations. To counteract this, a friend and myself climbed to the top of a naval navigation hill with the rig, a battery and the aerial.

My friend held the antenna mounted on a branch in his hand as high as he could in the air, while I attempted to get my long distance copy.

The same weekend I was successful in a long range copy of 190 miles from Wedge Point to Busselton, W.A.

All I can say is, who needs towers?!

ENTHUSIAST,
Hamersley, W.A.

"MAYDAY MAYDAY"

I was interested in your article "Mayday Mayday" in Log Book, CBA issue 36. As you will recall, a Mr. Aaron MacNellie got into trouble when his boat's battery went dead. With his boat at the mercy of the seas, he called what was later described as an unnecessary Mayday. Being an unlicensed radio operator, Mr. Mac Nellie had his equipment confiscated, and suffered some abuse at the hands of officialdom.

Mr MacNellie seems to have been unnecessarily penalised and reprimanded.

During Cyclone Simon at the end of February, the 2,800 ton 'Polta' two and a half miles out to sea near Fraser Island put out a Mayday call even though there was nothing wrong with the boat.

The call was due to the high winds which could have forced the 'Polta' ashore. Later on the skipper cancelled the Mayday saying that the situation was in hand.

Surely if Mr MacNellie deserved his reprimand, so too would have the master of the 'Polta' but to date I haven't heard any action taken against the 'Polta'.

Where is the justice?

A. G. LANHAM
Nambour, Qld.

POLITICAL COMMENTS

I would like to express my thoughts on Terry Watkin's political statements in the NCRA News of CB ACTION number 35.

My views are that citizen band radio is supposed to be non-political. I think that Mr Watkin didn't have to go as far as saying "I am sure that Senator Colson's efforts will not be forgotten by serious CB operators when the next Senate elections come around."

Most "serious CB operators", or any CB operators for that matter, are intelligent enough to work out who they will be voting for next election without any help from Mr Watkin.

Mr Watkin should have just informed us of the Federal Labour Party's comments and left it at that.

I will still be buying CB ACTION as it is an excellent magazine but will be by-passing the two pages or so of NCRA News.

Anyhow, who is going to believe a politicians' promise anyway.

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UHF

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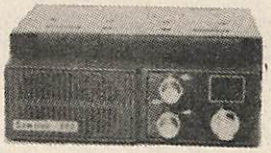

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10-4 STATESIDE

by George McCarthy

I wonder how many readers got a bit hot under the collar at last month's column in which I came down on the side of keeping the code test as a requirement to get a ham ticket. I'm well aware, of course, that some of the other contributors to this magazine have made all of the standard points on why that ancient art ought to be flung in the garbage can.

Perhaps it is just an issue that finds one on one side or the other and little can be done to change minds. It is very likely, however, that those who are waiting for a code-free licence will be very long in the tooth and still waiting some time from now.

I suppose the main thrust of my feeling is that anything of real value is going to have a price to it. Anything that is free or costs little is usually held in low esteem and treated quite casually. Simply examine the way a number of CB operators treat the channels and you will know what I am driving at.

If it wasn't the code I would like to see some other kind of hurdle that would be significant. As we say over here, it separates the men from the boys. I really can't believe that anyone can't learn the code. It comes more easily to some than to others, certainly females seem to learn it more quickly. There are some tricks to learning it rapidly which I wished I had known back when I was struggling with it.

I ended last month chatting about the fact that I was a bloody bank clerk at the time I got my ticket. It was becoming very obvious that the United States was going to get involved in the war. The only question was just when. Certainly, our government was taking actions that were to put others in a different position where they had to either back down and lose face or fight.

I was a mere lad of 18 at this time, but the first peace-time draft act was about to pass and fellows between the ages of 21 and 26 were going to be inducted by a lottery system. You might be interested to know that about this time I had to register myself and equipment with the FBI and have my fingerprints taken and certify that I had made provisions for disabling my transmitter if it were not under my direct control.

Back in those days we were very circumspect about the subjects discussed over the air. To listen one would think that there was no war going on, that politics and religion were non-existent and sex had never been discovered. Honest! To listen to both the CB and ham bands today it might be hard to believe, but that's the way it was then.

My parents were divorced in June of 1940 and the family home was sold. Life as a bank clerk was far from enticing, except for the espionage excitement. Really, I was going nowhere. I decided to join the Naval Reserve, since I had read in QST that they were taking in amateur radio operators at the rating of Seaman First Class, which paid the magnificent sum of 54 dollars a month. But, compared to the 85 I was making at the bank it didn't seem so bad. Enlistees were to put in one year of active duty and three years in the Reserves for their four year obligation.

What the hell. I was 19 by then and all I had to look forward to was being a bank clerk until I got drafted. I joined in September of 1940 at the height of the Battle of Britain. My friend W6PEA joined with me. We would get our obligation over with and, if there was a war, we would at least be in the Senior Service and not mucking around with a bunch of brown jobs!

This gets us back to the code bit. See, if you hang in with an old timer they eventually get back on track. As I said last month, I

threw my telegraph key out of the window in April of 1940 when I got my licence. Now it was October of the same year and I was lined up with 65 other recruits on a dock on Goat Island in the middle of San Francisco Bay. Paddy Ryan, a Chef Petty Officer with service strips up to his elbow was glaring at us, motley crew with our ill-fitting new sailor suits.

"How many of you can copy the code?" he asked. Twelve of us raised our hands. "Okay, each of you take one step forward."

Now we were out in front for all to see. We were beginning a four month course designed to make us navy radio operators, able to send and receive the code at 18 words per minute. Paddy shook his head in disbelief. He walked down the ranks and asked each of us how fast we could copy.

Most of us allowed as how we could copy around 13 to 16 words a minute. When he got to the end of the line he was facing the last man, a tall, skinny kid with glasses so thick the lenses looked like the bottoms of milk bottles. He had pimples on his face and an innocent smile, like that of an imbecile. In short, he was the archtype of a radio amateur.

"And how fast can you copy?" Paddy asked casually. "About 60 words a minute, I think," he replied. Paddy blinked a few times.

"Listen smartass, I asked a straight question and I want a straight answer, see."

The skinny ham who was Phil McKernan from Fresno, blinked back a few times and swallowed. "Sixty words a minute, I know," he said, modifying his answer to what he thought would please the Chief. Paddy stood in silence for a full minute staring at Phil. Finally he stepped back a few paces.

"We have here with us this morning a new recruit. But this recruit is different from the rest of you. This recruit is a smartass who says he can copy the code at 60 words a minute. What this here recruit don't know is that we have a brand new Hammerlund HQ120 on this here ship, the USS Boston, and it's just about time for WCX press wireless in New York to broadcast the news report, which they do at 55 words a minute. So all of you now fall out and fall back in at the radio room where we will all listen to this smartass copy the code from WCX."

Paddy was obviously relishing Phil's imminent downfall in front of this, the first class, organised under the new reserve program. We clambered aboard the rusting old cruiser, Admiral Dewey's flagship at the battle of Manila Bay during the Spanish-American war. It was to be sold for scrap, but began to sink as soon as it was towed away from the dock, so it was stuck in the mud of San Francisco Bay where it oozed up and down with the waves. It would be our workshop for four months.

Chief Ryan sat at the receiver and tuned in WCX. Sure enough there came the sound of high speed code, sent by tape. He smiled and handed the phones to Phil. The spider was inviting the fly into his parlor. Phil sat down and wiggled his fanny like a concert pianist, cracked his knuckles and adjusted a clean piece of paper into the brand new Royal typewriter.

He put the phones on and listened for a few moments. Then he began to type, perfect copy, a full sentence behind the tape. His fingers flew over the keyboard. The copy came out perfectly. Chief Ryan's eyes widened a little, but otherwise took it in good stride. After the page was full he tapped Phil on the shoulder and signalled that he could stop.

"And how fast can you send?" he asked gently.

"About that same speed, 55," Phil replied modestly.

"As of this moment you are a code instructor, my boy. You will take these other 11 feather merchant hams and teach them the code so they can copy at least 35 words a minute. Then each of them will take a small group of the rest and teach them. You will teach each other. Chief Ryan, it turned out, was nobody's fool and that is just what happened.

Phil had, naturally, brought his own Vibroplex speed key, complete in a velvet lined leather case. He could send like a tape machine. And he was ruthless. He sent code to us from 8:00 in the morning until 4:00 in the afternoon and we came back at night to practice some more. He would send for five minutes and then get up and inspect our copy. I was getting less than half of the text. After a few days I had progressed to 50 per cent copy at which point he said that it was time to speed up.

He kept pushing, sending over our heads. And we kept straining, reaching, trying. One day he slowed down. I could copy solid. No problem.

"How come you slowed down to 13 words a minute?" I asked.

"That was 25 words a minute you were copying," Phil replied. And so it was. In less than three weeks I was copying 35 words a minute.

When I was assigned to a heavy cruiser, months later, the communication officer held a copying test. I came in second place. Me, a bloody feather merchant smartass reservist. It made me no friends among the regulars who had been stationed with the fleet for years. Here was this kid, six months in service and a Third Class Petty Officer.

In due time the war came to us and I was put on a high speed intercept circuit between NPM in Honolulu and VHC in Canberra. It was 35 to 40 words a minute continuously. I copied a minimum of 14 hours a day. So much for the kid who had thrown his telegraph key out of his window when he got his ham licence. I rarely use the code even now, but I can still copy well over 20.

Now you know one of the reasons I think the code test ought to be kept. You can learn it easily. Just copy over your head, way over your head, for a month and you will sail through the test.

That's it for now, I'm 10-10 and QRT C B A

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BACK TO BASICS

Social communications

— getting the most from your CB

Two years ago the CB club scene was at a peak, but since that time the scene has slowly deteriorated until there are very few strong CB clubs left in the main city areas. Outside the cities, country CB clubs have retained a large proportion of their strength.

It is not really hard to understand why city CB clubs are dying. When someone starts into a new hobby — especially one where he may find new areas of technical knowhow — the new operator usually finds that discussion with more experienced operators can help. CB clubs are an ideal place for this discussion.

Likewise, many people having little experience with such an open communication medium, find that personal 'face-to-face' contact enhances subsequent on-air contact. As the new operator gains confidence in speaking to people he has not met, clubs cease to be necessary for successful on-air operation and he drifts away from the club scene.

If an operator rarely speaks to anyone outside of a select few — like in a country area — he may find a feeling of friendship developing which often leads to more personal contact — like at a club meeting. Hence, clubs and country areas seem to go hand in hand.

Some clubs in the larger cities seem to be surviving due to the number of CBers studying for a ham radio licence, usually the novice. Many CB clubs are now run by hams and these people promote the 'upgrading' from CB to ham radio. Whether or not it is actually an 'upgrading' is open to conjecture. Certainly UHF CB has experienced an influx of 'refugees from two metres', ham operators preferring UHF CB operation to ham radio. Still, CBers studying to get ham tickets form a large part of the city CB club scene.

The demise of CB clubs has often been likened to the situation with car clubs. When cars first made their appearance at the turn of the century, there were many car-enthusiast clubs. Not only did the motor vehicle represent a new area of technology, but enthusiasts banded together to exchange information and learn. These early clubs did much to get legislation introduced and formed much the same function as the CB clubs.

As the motorists learnt more about the technology behind their vehicles, and the vehicles were made easier to drive, the motoring clubs died out. Finally, roadside service evolved and this had the effect of saving the clubs from virtual extinction. If you check around the social car clubs now, you will find that not only do they cater for only a small percentage of all motorists, but many have a leaning towards racing.

There is every indication that CB clubs will evolve towards specialist CB applications — or they will die right out. Unfortunately, as CB clubs die out, so too does their power to change legislation.

The NCRA (National Citizens Radio Association) was the only national CB organisation to fight for CB in the political arena. Due to the lack of interest in CB organisations, and also to some extent the political infighting within the NCRA, this national body has virtually folded. Few states have NCRA

continued on next page

BELOW: Members of a CB social club enjoy a bar-be-que outing.

representation and there are limited funds available to the national body. The power behind such an organisation has therefore been eroded and one can expect them to have little influence with politicians.

CB radio is a personal thing for the user. Most CBers have little interest in anything beyond their own operating practices and few care about political aspects. Whether this will be good for CB in the long term is debatable but this would not stop individual CBers from retaining their personal-only interest in the hobby.

Far be it for this magazine to say that all CBers should belong to at least one CB club (especially one affiliated with a national body) but the end results from not supporting the hobby are obvious. The national P-Day rallies were an example of little national organisation. While many centres had excellent rallies — fully supported by the local operators — some centres weren't represented at all. This was due to lack of local organisation — concerned CBers waited for someone else to organise the local protest. Needless to say, everyone was waiting for everyone else and nothing was done.

CB is a social hobby but the social aspects vary from operator to operator. To try and make all CBers conform to the same pattern would do little to enhance the hobby and in fact many operators would drop out of the scene. In some ways, this is what happened in late 1977 and during 1978. The newer CBers overused quasi American slang and the older CBers resented many of the expressions used. Disenchanted by the unnecessary slang, these pre-legalisation CBers filed their CBs in the bottom of the cupboard and left the scene to the 'good buddies'. CB in general suffered by the loss of these experienced operators who could have injected some sanity into the then chaotic CB band.

It has taken some two years for CBers to learn how to conduct themselves on-air without the assistance from the older CBers. With assistance, this 'training' period could have been reduced considerably and the current CB scene could have been much improved.

While the CB industry complains about lack of consumer spending — with many inaccurately claiming that CB is 'dead' — CB as a hobby has strengthened as fewer new operators come on to the bands. This has meant that the CB scene in Australia has a chance to consolidate, to clean up the few ratbags and vandals remaining on-air, and to forge a service of which our grandchildren can be proud.

As a method of social communications, CB radio has few peers. No other medium offers the opportunity to converse with others, without pre-selecting them or without having spoken to them before.

CB radio also gives users a chance to improve their communication skills and many operators have found that comprehension of current events has improved dramatically. Public speaking skills and other areas of debate have also been improved as CB radio allows the operator to broaden his horizons.

Television has often been blamed for the breakdown in communications within a family and many people seem to be losing much of the communication skills due to introduction of shopping supermarkets and other areas with little verbal exchange. CB reverses these trands.

ABOVE: Recently, the Radio Melbourne CB Group organised a combined ham and CB field outing. This was some of their equipment.

It is true to say that many operators have trouble initially in relearning the art of communications. For this reason, some people come on air and act in decidedly anti-social ways. They play music, swear and deliberately interfere with other operators. With a small amount of patience — and no encouragement from their peers — these anti-social operators soon develop the necessary skills and confidence to come on air and behave rationally.

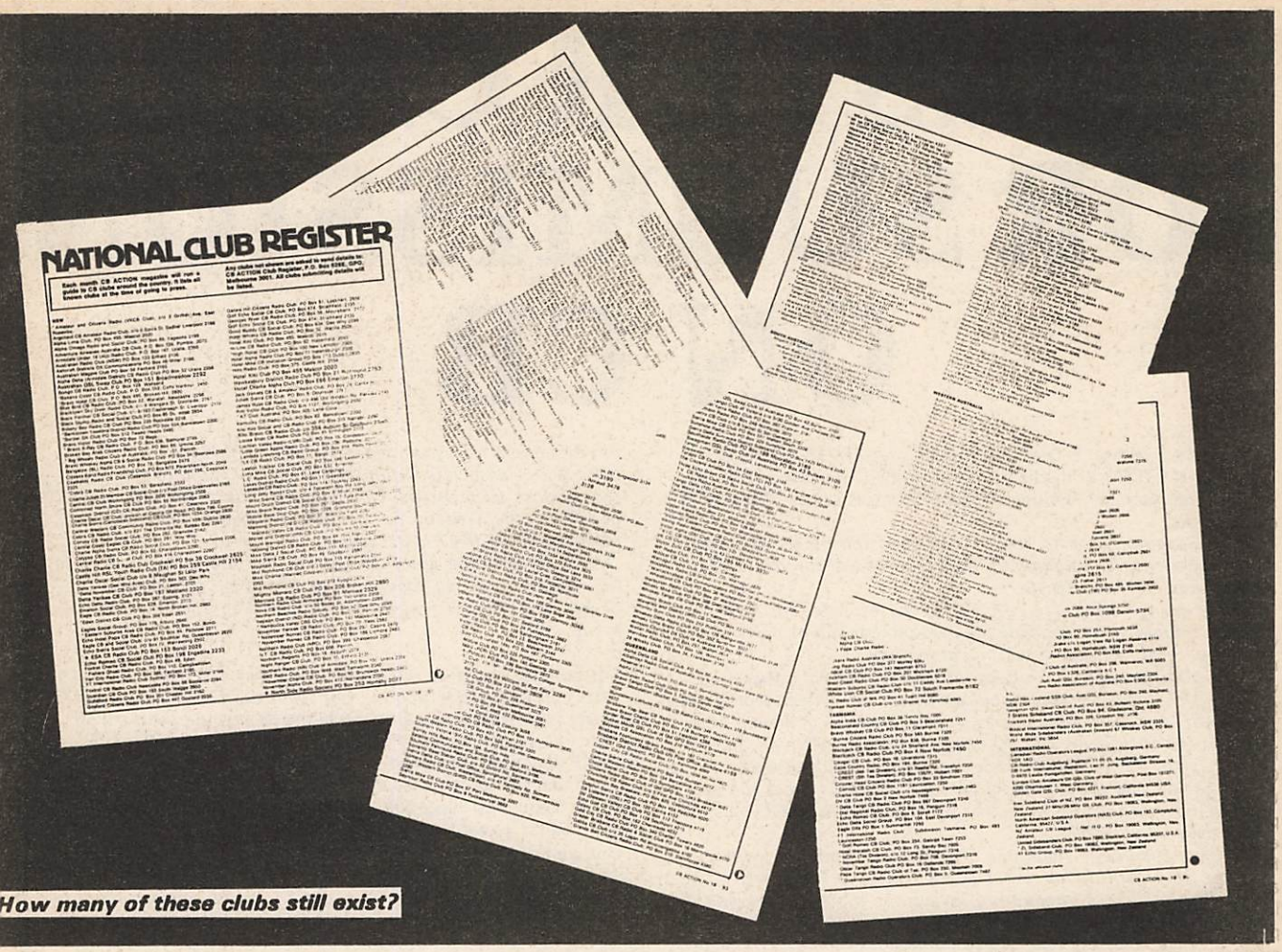
Of course there are always a few individuals who do not, or cannot, learn correct behaviour and will probably always remain ratbags. It should also be remembered that these few disturbed people would also behave irrationally in other areas, say driving on the road, or when among crowds.

Unfortunately CB radio has received bad publicity from the vocal minority. It is in everybody's interest to ensure that the truth about CB — and the small number of idiots actually on-air — is relayed to the general public. Motorcyclists in the 1960s had a similar 'image' problem to overcome. They were assisted by the national advertising slogan "You meet the nicest people on a Honda". Top marks for the Honda motorcycle people for this slogan as it did much to reverse the 'Hells Angels' bikie image.

It really doesn't matter how much publicity is given to the good side of a hobby, people will judge the hobby by the type of people they meet or hear about. You can tell the public about all the nice people riding Hondas, but if every Honda rider seen by the public was a 'bikie', public opinion would still be poor. CB is in an identical situation.

CB operators have an identity crisis. If the operators don't care about public opinion, the public won't care about them and the CBRS could find itself in a poor situation. The Government is very wary of public opinion — this is what puts them into power — so they could react in a negative manner towards the CBRS if the public was not behind its concept.

Many words have been written about the reason CB was legalised so quickly back in July 1977, but the author is convinced that it was due to a public poll conducted in April of that year. The poll indicated that over 60 per cent of the Australian public were in favour of a CB service (well, they weren't against it anyway) and such a large number of voters can't be ignored.



How many of these clubs still exist?

We feel sure that if a poll was taken 12 months later (April 1978), we wouldn't have a CB service today. Luckily, the media has backed down on its anti-CB stand, so apparent if you read back through the headlines of that era.

We are currently in a situation where the media tends to ignore us so we at least have an opportunity to sort ourselves out without the press 'breathing down our necks' and reporting all our little mistakes. Be thankful for small mercies!

It doesn't really matter if you operate one hour a month, or 20 hours a day, the public's image of CB radio reflects on you, the operator. Being known as 'one of those' (a CB operator), can affect personal and business contacts not associated with CB radio. It is therefore in your interest to ensure that the CB image is good, and you can only do that by making sure that your operating procedures are beyond reproach.

It is true to say that every walk of life is found on the CB bands. CBers are not limited to only one or two stratas of society but include doctors, lawyers, clerical staff, tradesmen, unskilled labourers and the unemployable (this being distinct from the average unemployed individual).

Sometimes there are problems when a well educated person tries to communicate with a barely literate. There can be resentment from both sides and unless they are prepared to try and understand each other, little real communication can result. 'Understanding' remains the key word. From comments heard on air, there is often little understanding between 27 meggers and UHFers, between people in different walks of life, and between people with different values and ideologies. To learn understanding, all CBers must be prepared to listen to another point of view and then accept or reject it without entering into personal abuse.

Many people are not prepared to mention their own likes and dislikes in case someone else makes fun of them. This in turn leads to limited conversation topics which affects overall enjoyment of this hobby.

One suggestion raised in a group QSO on this subejct was that at least one CBer in a group take the 'opposition' viewpoint, regardless of his own personal views. For example, you could discuss capital punishment with people putting forward views both for and against. No-one need 'win' such a debate, but the general airing of views could do much to help clarify the situation for people without a preset opinion, and the use of debating techniques helps everybody to learn the arts of public speaking.

There are many topics for such a debate but the standard controversial subjects — sex, politics and religion — are always good for getting other people involved. Whatever subject is discussed, it must be stressed that emotional outbursts should not be tolerated. The purpose is debate, not necessarily personal opinion where an individual may become emotionally involved.

It takes a good chairman to ensure that any QSO moves quickly, allows everyone to participate, and that personal abuse does not happen. Some chairmen may find that it pays to regularily mention that the QSO is a debate and comments made are not necessarily the personal opinion of the speaker. This saves a person 'on the side' from forming an untrue picture of the participants of the QSO — especially when very controversial subjects are raised.

To communicate socially, one may not necessarily need CB radio. However, CB does provide a unique forum for social communications. A few years ago, the concept of CB radio as a forum for learning communication skills was far from the minds of the vast majority of Australians. One wonders what the next few decades will bring? Current trends are away from personal communications — people just don't seem to like talking to other people.

Widespread use of CB radio could well reverse those trends. CBA

MINISTER CALLS FOR SUBMISSION ON CB

Two days before 'P-Day', the Minister for P&T, Mr Tony Staley sent CB ACTION a 'media release' entitled: Review of Citizens Band Radio Service Frequency Policy. The text of the release was as follows.

The Government is to review policy on the most appropriate radio frequency arrangements and regulations for the Citizens Band Radio Service (CBRS).

Announcing this today (27/3/80), the Minister for Post and Telecommunications, Mr Tony Staley, said that submissions would be sought from all sectors of the community.

The Minister said that when the CBRS was introduced on 2 June 1977, the government indicated that the service would use both VHF and UHF frequencies. It occupied 18 channels at 27 MHz in the VHF band and 40 channels at 477 MHz in the UHF band. Use of the 27 MHz service was to end in June 1982.

Mr Staley said that he had long been concerned that the decision to move the service out of the 27 MHz area in 1982 would be potentially unworkable.

"I have frequently reiterated this view in meetings with user groups, CB organisations and relevant sectors of the industry," he said. "I have always intended to review the matter at the end of the World Administrative Radio Conference (WARC), which was held in November last year. Today's announcement gives effect to this long-standing undertaking."

The Minister noted that the introduction of the CB service had led to some interference to television and other electronic equipment. "I believe that the position has now stabilised," he said. "The level of complaints in recent times has fallen quite considerably.

"A tribute should be paid to CB radio organisations and clubs and indeed, the great majority of CB users, for their efforts to regulate the service so that the usefulness of the service, particularly in safety and emergency situations, would not be placed in jeopardy."

The government has learnt from the introduction of the CB service, and the Post and Telecommunications Department had arranged for further staff increases to ensure proper management of the radio frequency spectrum.

"In keeping with these developments the government is now seeking to fully canvas all viewpoints before any final decisions on the frequency arrangements are taken," Mr Staley said.

"After considering the public's submissions, my department will prepare a report to me which will be published and circulated for further comment."

Details of where to send the submissions and of closing dates would be widely advertised within the media, and major user organisations and business interest would be notified in writing, the minister concluded.

On the following day, the Minister sent CB ACTION yet another telex media release. It is as follows:

TERMS OF REFERENCE

To report to the Minister for Post and Telecommunications as soon as possible on whether the present 18 channel 27 MHz Citizens Band Radio Service, which was established on 2 June 1977, should be retained after June 1982.

In considering this issue, regard should be had to:

1. *All matters associated with the technical operating conditions, regulations, frequencies, channel allocations and procedures governing the Citizens Band Radio Service in both VHF (27 MHz) and UHF (447 MHz) bands.*
2. *The need to utilise and manage the radio frequency spectrum for maximum overall benefit to the Australian community.*
3. *Australia's international obligations in radio frequency management.*

and

4 *The need to minimise interference to other services.*

After careful consideration of both Ministerial press release CB ACTION feels well qualified to make the following observations.

Both releases repeatedly name 27 MHz CB as an inclusion in the VHF spectrum allocation.

This in fact is not the case and we believe 27 MHz will remain in the high frequency allocation until the whole spectrum plan is revised — as far as we know, this will never happen.

Our confidence in the credibility of both releases would be considerably improved if the department in question researched the basic facts sufficiently to realise the 11 metre citizens band is located below 30 MHz where, incidentally the VHF allocation begins.

Almost on the eve' of Australia's largest and best organised citizens radio demonstration — P DAY — Mr Staley's press releases appear to be a last minute attempt to quell the millitant attitude of thousands of CB operators who have been allowed to stew in the juices of P&T most ill conceived and managed licensing venture in the history of radio communications — the CBRS.

The effect was felt, in Tasmania at least, when on the following day a rally organiser phoned to ask if the rally would still take place. Apparently the Tasmanian press gave the releases considerable space.

While we applaud the concept of the submissions, CBers should be aware that it could be a ploy to keep the fight for 27 megs out of the headlines and allow the potentially volatile situation to abate. Dont forget, the Minister claimed in Parliament that channel 5 was a legal emergency channel when in fact it is not.

The Minister does not even have to follow the advice from his Departmental heads, much less take note of submissions sent in from private citizens.

Still, for the sake of a 22c stamp, we ask all CBers to either fill in their preferences on the attached submission form or write out their own and send it to the Department. However much we may question Mr Staley's motives in this matter, if he doesn't receive submissions from individual CBers then he will quite rightly claim we aren't interested. Of course this isn't true.

The following form will appear in the next few issues of the magazine to give all CBers a chance to make their thoughts known to the Minister. C B A

STOP PRESS: As this article was going to press, P&T phoned CB ACTION to inform us of the error in regard to 27 MHz being on 'VHF'. The wheels of bureaucracy move slowly, but at least they do move. Editor.

CB ACTION/MOBILE ONE
SUBMISSION ON CB RADIO

To: The Secretary
Post & Telecommunications Department
GPO Box 5412CC
Melbourne
Victoria, 3001

Dear Sir,

Please accept the following Submission as my views on the CBRS. My full name and address appears below and I would appreciate acknowledgement on receipt of this letter.

Yours faithfully,

.....(signed)
.....(full name)
.....(postal address)
.....
.....

27 MHz (HF) CB

Please discontinue 27 MHz CB after June 1982..... ☐

OR

Please continue this band with the present 18 channel system..... ☐

OR

Please note the following alterations I would like to see to the current 27 MHz service:

- increase the number of channels available..... ☐
- ban the use of AM except for equipment checks..... ☐
- allow the use of FM transmissions on 27 MHz..... ☐
- allow the use of VFO equipment..... ☐
- increase the output power..... ☐
- permit overseas DX calls to be made..... ☐
- ensure that AM traffic is limited to certain channels... ☐

other.....

.....

.....

.....

477 MHz (UHF) CB

Please discontinue 477 MHz CB if and when 930 MHz becomes available..... ☐

OR

Please do not alter this band in any way..... ☐

OR

Please note the following alterations I would like to see to the current 477 MHz rules:

- increase the number of channels available..... ☐
- allow SSB transmissions on selected channels..... ☐
- permit the permanent installation of repeaters..... ☐
- increase output power to at least 10 watts..... ☐
- ban business operations on this band..... ☐
- reduce licence fees for UHF only stations..... ☐

other.....

.....

.....

.....

PROPOSED 930 MHz (UHF) CB

Please do not introduce a 930 MHz CB service into Australia..... ☐

OR

Please introduce the 930 MHz CB service:

- when the ITU agrees to the international allocation.. ☐
- immediately..... ☐
- with FM only transmissions..... ☐
- with both FM and SSB transmissions on separate channels ..... ☐
- with a minimum of 80 channels..... ☐
- with at least 10 watts output power..... ☐
- with automatic telephone connection..... ☐
- with automatic identification..... ☐
- with repeater operation..... ☐

other.....

.....

.....

GENERAL

Please do not alter the existing RB 14 and RB 14A documents..... ☐

OR

Please alter the Conditions Governing the CBRS as follows:

- ensure that there are legal emergency and general calling channels..... ☐
- allow the use of beam antennae in built up areas..... ☐
- ban the importation of illegal radio equipment..... ☐
- reduce import duty and sales tax on CB radios ..... ☐
- spend a higher portion of the licence fees on policing the CBRS..... ☐
- license technicians and ensure that only they can repair CBs..... ☐
- allow third party traffic on the CB bands..... ☐
- allow the connection of CB radios to telephone equipment..... ☐

other.....

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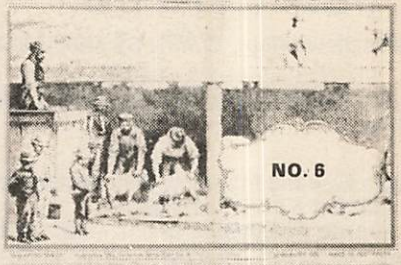

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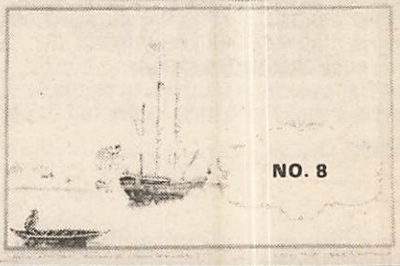

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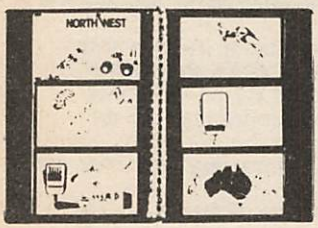

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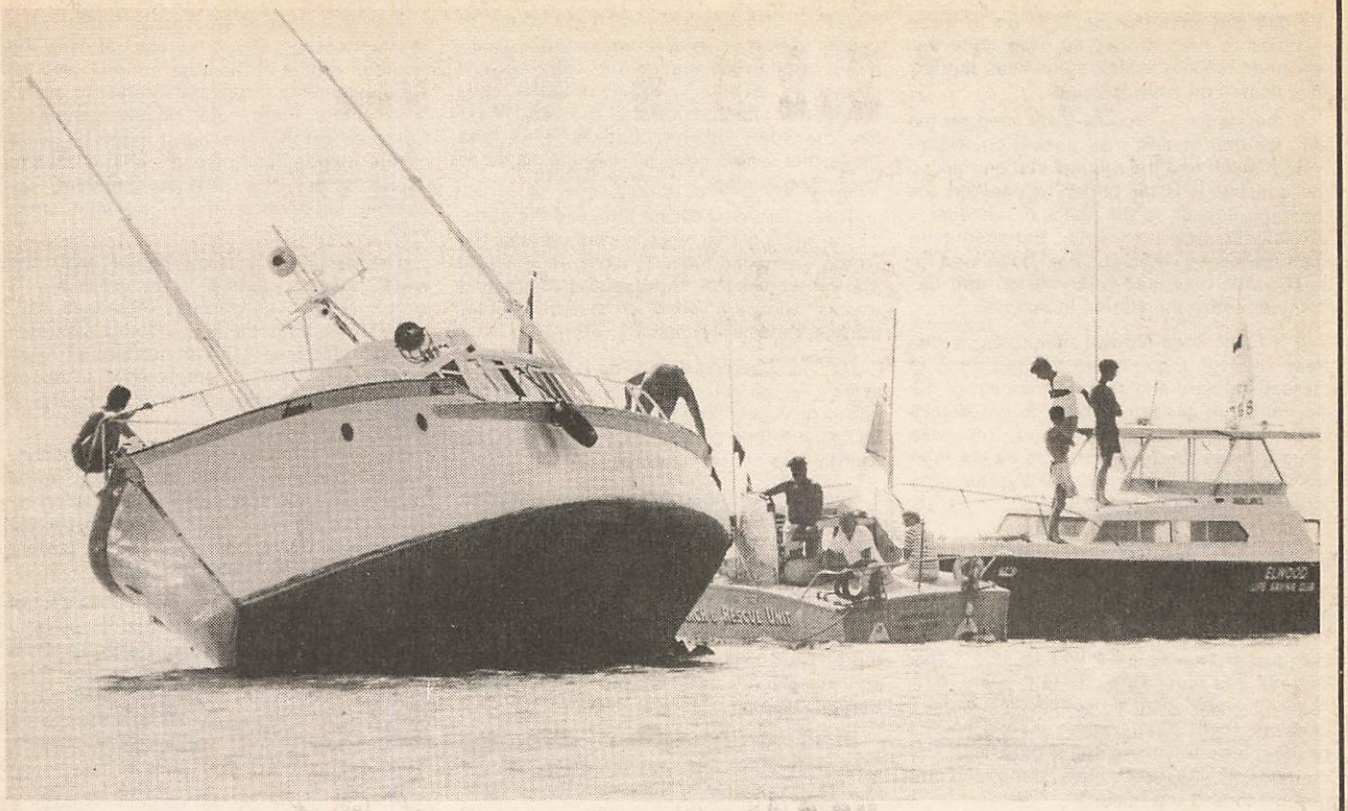

Emergency traffic

— *the life you save may be your own*

The potential advantages of two way radio in emergency situations have long been recognized. While the average CBer will probably never use his rig for anything more exciting than rag chewing, locating petrol or lining up the shopping for the missus, there have been occasions where CB radio has meant the difference between life and death.

Although such cases are rare, they do exist and every CBer owes it to himself — and others — to have some knowledge of proper operating procedures for emergency traffic.

There are those who doubt the effectiveness of CB radio in such a role, but CB ACTION has received many reports of CB radio serving as a vital link in emergency situations. Motorists stranded in the outback, weekend sailors in trouble at sea and hikers and campers in difficulty have all relied on CB when things get rough. Such reports illustrate the need for preparation on the part of every CBer. This article will attempt to outline the proper procedures for handling traffic when an amergency threatens.

The first point which must be cleared up is "what exactly constitutes an emergency?" Obviously there are varying degrees of difficulty a CBer may find himself in. At what point does a problem require a distress call? It is far too easy to "cry wolf" when a problem is not really serious. On the other hand it is also possible to wait too long to get help.

Partly to overcome this problem, the powers-that-be have decreed that there be three classes of emergency message. The most serious difficulties justify the use of the distress call. Such a call is used only when the caller is threatened by "grave and imminent danger" and means that the caller is requesting immediate help.

This call may be sent by voice or, for those stations equipped for it, CW. There are designated calling frequencies for ships and aircraft to use for such messages, but the regulations state that if no reply is received on the normal channels, a station may repeat the distress call on ANY frequency.

The distress message using CW begins with the familiar SOS signal. It is interesting to note that this signal is not really a collection of letters as commonly believed. The Morse code signal dit-dit-dit-dah-dah-dah-dit-dit-dit was chosen to indicate a distress message simply because it was easy to recognize. The meanings assigned to the call (e.g. Save Our Ship, etc) were assigned later, perhaps by enthusiastic newspaper reporters looking for some "human interest" to fill out a story of a shipwreck.

In any case, CBers are far more likely to receive — or transmit — a distress message by voice, either AM or SSB. In this case the message should be preceded by the Mayday call. This derives from the French words M'aidez, meaning "help me", very apt as can be seen.

If the calling station has the time and sense to send a properly structured distress call it would consist of the word Mayday sent three times, the words "this is" followed by the name of the station sent three times, with the whole thing sent three times. This would be followed by the message itself, which would give details of the trouble and the help needed.

Someone hearing such a message must immediately begin monitoring the frequency used for the distress call. If you hear such a call you should note any requests for assistance and, provided that you don't interfere with someone better suited to help, answer

continued on next page

the call and pass the message on to those qualified to help. Once you have done this you must resume listening and keep authorities posted on developments.

If the station in trouble can't keep up the call, another station may pass it on, identifying himself and the original station making the call but it is far better to pass on the message directly to the police or whoever is suitably equipped to help. Retransmitting such messages when you are not trained for such traffic may lead to confusion and further jeopardize the station in trouble.

If a CBer finds himself monitoring a distress call it is a good idea to keep a log of messages heard and sent. In the heat of the moment it is far too easy to forget details which might be important later. This also helps to keep the operator calm as the time spent writing is valuable in getting thoughts together. This helps avoid panic.

An important point to remember is that the station making the distress call is the station responsible for controlling the contact — unless he delegates such responsibility to another station. This means that if the guy in trouble asks you to stop transmitting, you must stop. He is the one most likely to know what's needed and is more likely to think clearly when there's no-one bashing his ear with helpful suggestions. Remember, if you don't have something important to add, stay quiet!

When the emergency has been resolved, hopefully with a happy ending, the station in charge of traffic, which as we stated is usually the station originating the call, will announce an "all clear". According to the regulations this should consist of the word Mayday, the words "hello all stations" sent three times, the words "this is" and the name of the calling station.

This is followed by the time and the name of the station that was in distress and the words "seelonce feenee" which is again an English version of the French words and means "silence finished". They indicate that normal transmitting may be resumed.

Having covered what to do if your boat is sinking, your car is broken down on the Nullarbor or your girlfriend has just been bitten by a snake, let's take a look at what to do for slightly less critical messages.

The second class of emergency message is the urgency signal. This is used to indicate that the caller has a very urgent message concerning someone's safety or the safety of a boat or plane (these are not heard too often on the CB bands, as the reader can imagine). This class of signal is used when the distress signal cannot quite be justified and has priority over all other traffic except Distress signals.

Urgency signals begin with the word Pan sent three times and may be addressed to a particular operator or addressed to all operators. If sent as a CQ then it must be cancelled when it is no longer needed.

The final class of emergency traffic is the safety message. This one does not carry the sense of drama of the others and is used for announcements of general interest to everyone's safety. There would be few reasons for CBers to use this one, but it might be heard on the marine bands when a ship wishes to advise others of a potential problem, say floating logs which might threaten small craft.

The security message begins with the word "security" spoken three times and is structured like the previous messages. (Actually the word is the French word 'securite', which in this case is pronounced the same as the English word. It almost pays to speak French if you're going to have an emergency!)

The final point to remember is that elaborate rules are laid down for distress traffic only to ensure clarity and speed in an emergency. If the reader finds himself in trouble he shouldn't feel obliged to have perfect technique before calling for help.

On the other hand there have been a lot of false alarms over the years and if you're in trouble, a professional approach is more likely to be taken seriously and get you a response. Keep your calls short and clear, remain calm — especially if your first calls are not answered — and be patient. Panic is your worst enemy in any emergency.

After all, if you're still capable of putting out a call, things can't be that bad! CBA

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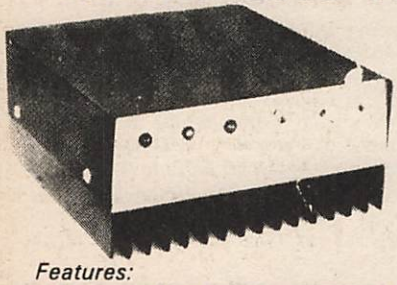

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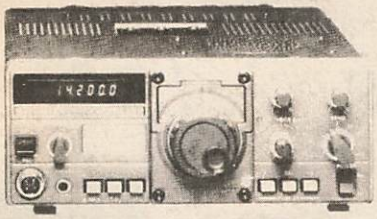

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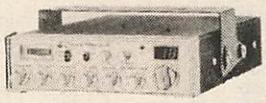

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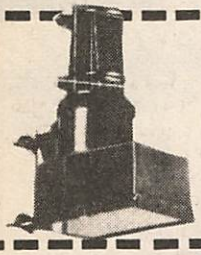

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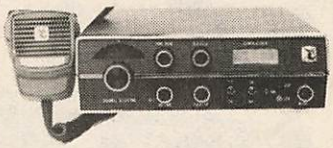

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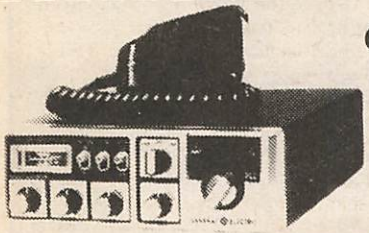

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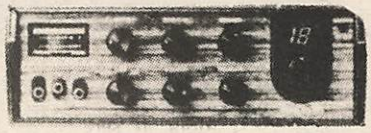

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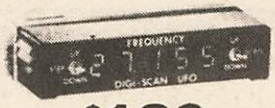

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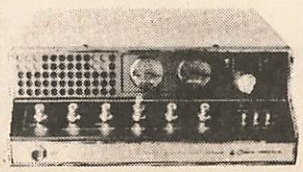

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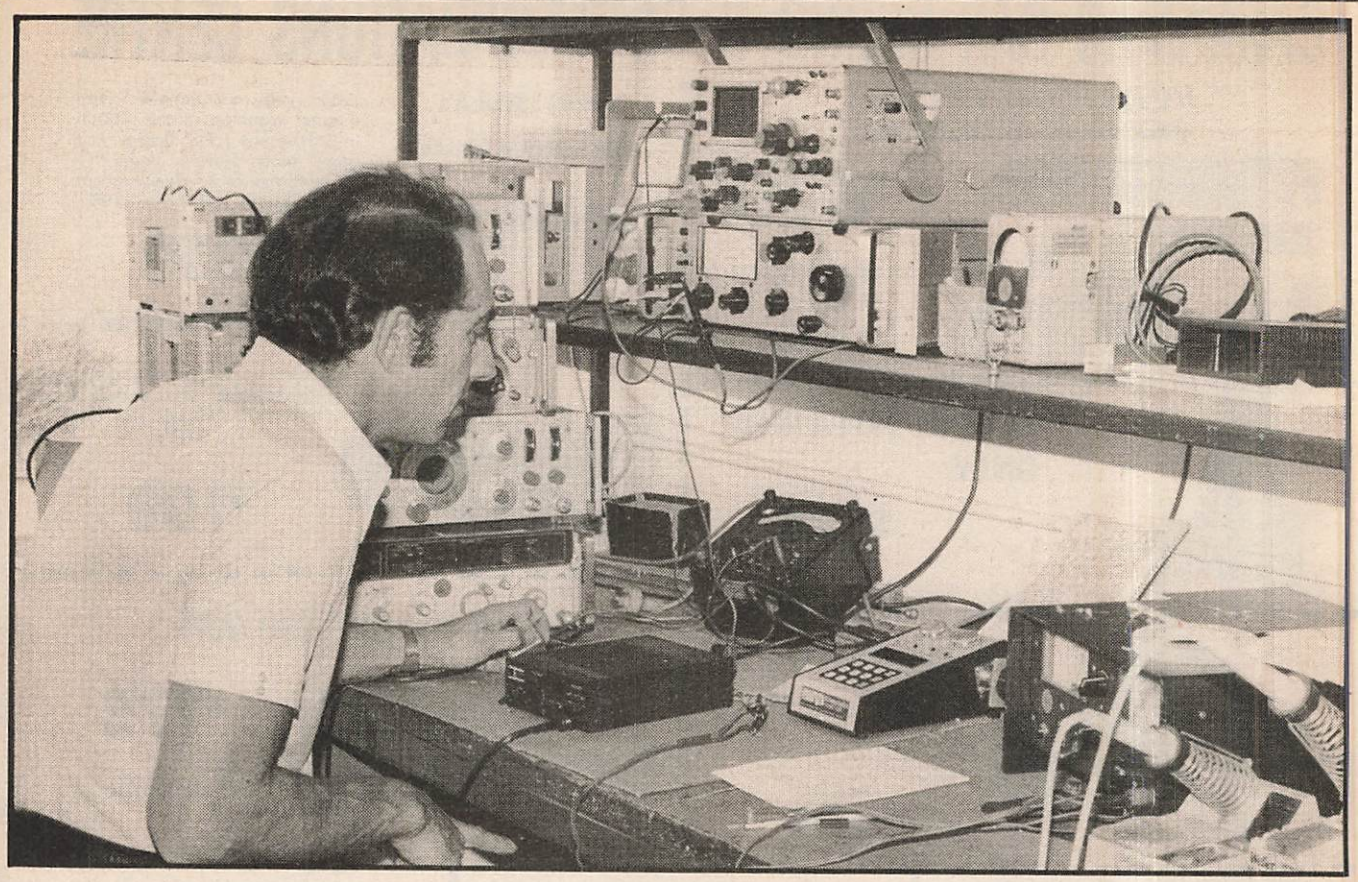


Upgrading the FM320

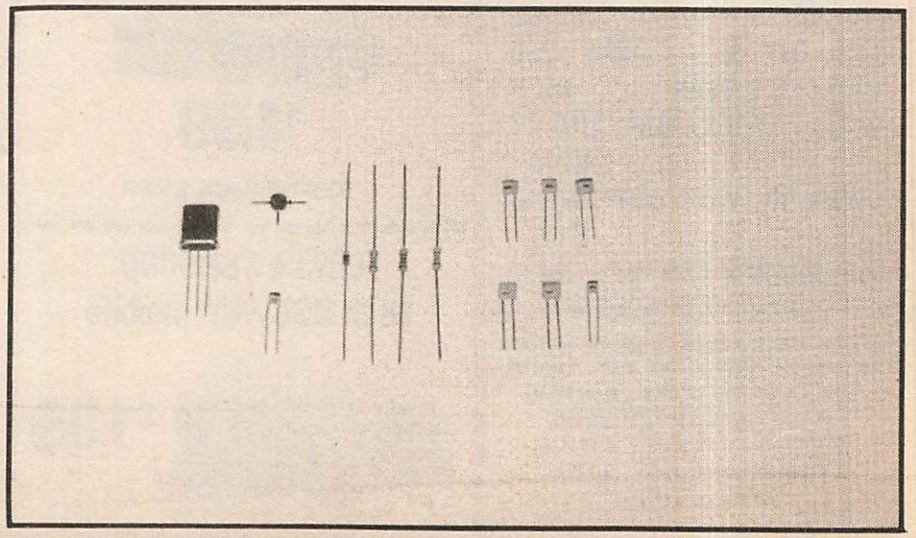
The good news is that Philips TMC have finally released their FM320 'update' kit which is available throughout Australia from more than 400 approved service outlets who Philips consider are technically competent to install the modification for FM320 owners. The kits have been type approved by P & T lending an air of legality to the procedure — which simply means you won 't get 'busted' over the modifications.

Although the release of such a kit has been in the wind for some time there will be many FM320 owners who are unaware of its existence, and still others who have heard about the proposal but are probably puzzled as to what the changes entail and, most of all, what benefit can be gained from the installation.

Philips TMC have kept us advised of progress all through development and approval of the kit, and although we had a fair idea what was involved, there is no substitute for an on the spot demonstration. With this in mind we contacted Philips at their manufacturing facility in Melbourne and said, "How about it blokes?" The answer was exactly as expected. In their usual obliging manner, they invited us to the test facility for a full briefing and practical demo of 'before' and 'after' performance checks.

We were warmly greeted by a group of TMC personnel and led to the quality assurance laboratory located in the depths of their top security establishment. Nothing gets in or out of this place without passing under the scrutiny of armed guards and a comprehensive network of closed circuit television cameras.

A brand new FM320 transceiver still in its original packaging — which was supposed to prove there was no hanky panky in the way of rigging the experiment — was waiting for our collective attention. Having considered that packaging takes place on the premises and it would be a simple task to hand pick a rig which suited the purpose better than one at random — not that we believe for a minute they would try to railroad us — we had an ace up our sleeves that would add credibility



to the test and if anything was rigged, would rip the wheels off their little red waggon.

The idea was simply to refuse the offered unit and request a new selection in our presence. Unruffled by the request — they were probably expecting something of this nature — a second unit was chosen at random from a batch of sets posessing reasonably early serial numbers. Back to the lab with the alternative and we were all ready for action.

The test equipment was connected and FM320, serial number 4394 was put through its pace. The results from the first run were decidedly average and we all breathed a sigh of relief.

Before continuing with a round-up of the initial results, a few words of explanation regarding receiver sensitivity figures are in order at this stage.

Many CBers remain puzzled about the significance of a peculiar word which frequently turns up on technical specifications sheets and in our rig reviews — namely SINAD. Most operators are easily able to relate the term micro volts (uV) as being millionths of a volt, but the suffix of 12dB SINAD has them stumped.

SINAD is an abbreviation for the expression — signal strength to noise plus noise and distortion. Obviously the input sensitivity of a receiver must have a relationship to some other parameter and since noise is always present within the circuitry its level makes a good reference. As we all well know, if the signal is weaker than the noise level, it cannot be heard satisfactorily.

In a frequency modulation (FM) system it has been discovered that if an input signal is 12dB greater in level than the combined noise and distortion readings of the entire receiver chain it will be readable and therefore of value to the listener. Anything much less and copy becomes difficult. Now, if we employ this reference as a minimum requirement, i.e. the signal must be readable and not just detectable to the ear, we can then quote how many micro volts of signal energy are required to produce this effect. In this way we are assured of the total quality of the system and not just the fact that a tiny signal can be heard through the speaker.

As a further example, suppose you are listening to a signal from your receiver, but it is just not quite loud enough to understand what the operator is saying. This means that although the signal's presence is obvious, the 12dB SINAD minimum requirement has not been reached. It is therefore possible to detect stations which are much weaker than the quoted sensitivity but readability is impossible.

Now that we are all expert in sensitivity measurements, let's consider the test results obtained from the Philips laboratory.

The receiver turned in 0.56 micro volts for 12dB SINAD which is quite close to the 0.6uV minimum specification. In other words we had an extraordinarily ordinary receiver on our hands. The weakest signal which would be readable would generate 0.56 micro volts at the antenna input terminals.

The test was carried out on channel 35, (477.275MHz) and to evaluate the adjacent channel rejection a strong signal was

```
FM320-UHF
TEST F     790720
Ser. No.     4394

CHAN.39 NOM FREQ
477.375000    MHz

TX Test

 Tx Freq. Error
      -450.0  Hz
 Tx Output Pwr
         5.2  W
 Nom. Deviation
         2.3 kHz
 Max. Deviation
         4.9 kHz
 Tx Audio Dist.
         4.4  %
 Tx AFResp@0.3
        -4.3 dB
 Tx AFResp@3.0
         2.5 dB
 Tx Current
         1.4  A

RX Test

 Rx SINAD 0.6uv
        21.0 dB
 Rx AFResp@0.3
        -2.9 dB
 Rx AFResp@3.0
        -8.6 dB
 Rx Hum & Noise
        44.9 dB
 Rx Output Pwr.
         1.0  W
 Rx Audio Dist.
         8.0  %
 Rx Current
         0.5  A

CHAN. 3 NOM FREQ
476.475000    MHz

TX Test

 Tx Freq. Error
      -400.0  Hz

RX Test

 Rx SINAD 0.6uv
        21.1 dB


Test Passed

Operator: M.H.
Date: 26.3.80
```

ABOVE: Printout from Philips' 'brain' after the receiver kit was installed. Receive sensitivity shows 0.6 uV for 21 dB which approximates 0.35 uV for 12 dB SINAD.

injected on channels 36 and 34, and the level was increased until a predetermined amount of signal could be heard on channel 35. Rejection for the down side was -48.5dB and the high side produced a little poorer figure of -45.5dB.

This means that a signal which was 45.5 or 48.5 dB stronger on the respective adjacent channel would break over on channel 35 and thus cause interference.

This feature has always been one of the problem points of the FM320 and can be quite a nuisance when a nearby station fires up on an adjacent channel — especially if you are straining to hear a distant station. Owners who are somewhat isolated from other UHF operators will probably never realise that the adjacent channel rejection is not quite as good as might be desired. In fact they would have no complaints in that area at all.

It is sufficient to say that the figures were quite typical for a standard first generation FM320.

We were satisfied that the results were genuine and the next step would be to have the modification kit fitted. The operation took about 20 minutes to change 13 components which included the fitting of a crystal filter. The kit is priced at a very reasonable $12, however, unless you are technically competent you would be well advised to have the alterations made by an approved service agency.

Back in the lab, the now modified and realigned set was checked for any improvement in performance.

With a BFW 92 high gain low noise transistor fitted to the front end we noted a definite increase in sensitivity and the new figure was 0.35uV for 12dB SINAD. An improvement of 0.21uV — doesn't sound much but an operator would find it quite worthwhile. Where the modification really shines is in adjacent channel rejection. The figures were now -70 and -71dB which is an improvement of 21.5dB and 25.5dB respectively. What this means in real terms is that for a signal to interfere after the alteration it would have to be much greater than 100 times more powerful.

In other words, an interfering station who caused a measured level of 'splash over' running 5 watts output would have to increase his power level to in excess of 500 watts to generate the same amount of interference or, alternatively, move much closer to your station. Since he or she is not likely to do either, the chances are that your interference problems would be instantly rectified. Now that's a pretty good deal for $12 if you 'do-it-yourself', and still won't break the piggy bank if you have the kit fitted for a recommended price of $30.

As a result of the tests we can only conclude by recommending the modification to all FM320 owners who wish to transform their already good rig into a much better performer for minimum outlay.

Remember that this is a factory approved modification and having it fitted will not void your warranty as will many other alterations.

Thanks Philips for a timely addition to your transceiver, but just one question, why did it take so long?

continued on next page

While we were at the Philips' factory, we had an opportunity to look over the assembly line and discuss the development of the FM 320 over the past two years.

Needless to say, Philips were rather reluctant to discuss problems associated with the FM 320 — which, let's face it, is normal in any manufacturing enterprise — but after some persistant pressure, they finally admitted that, yes, they had initially had some problems with the first two batches of LEDs from Fairchild.

However, they were quick to point out, all the problems with the LEDs are solved and unless someone bought a very early serial number 320, perhaps from a country dealer, new buyers shouldn't worry about the channel display.

Over the period of manufacture, the FM 320 has been subjected to many minor changes in components, mainly due to changing individual components when they became unavailable or when new ones came on to the market.

While the effect of slight individual component changes may not be noticed by an operator, the combined effect of dozens of changes has made the latest model — jokingly called the Mk 2 — a much better radio.

It doesn't matter how good a radio is, it can always be improved. The following is a list of fairly cheap improvements we feel could, and should, be incorporated into the FM 320.

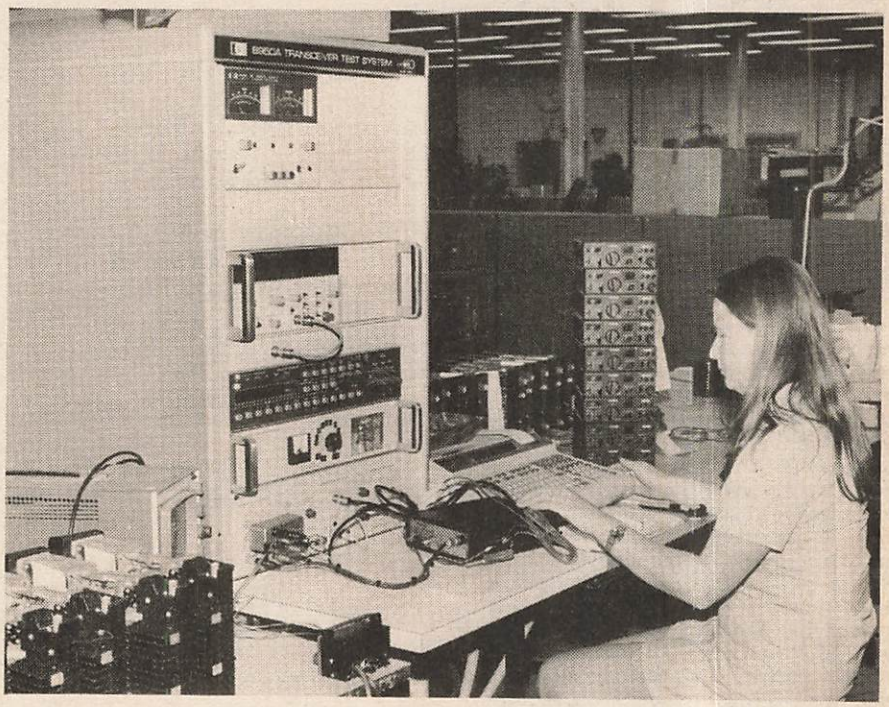
a. Remove channel change click.
b. Add a more effective heat sink to rear of set.
c. Replace 'F' type antenna socket with BNC.
d. Add scanning facility.
e. Build a base version with built-in power supply, receive modification kit and base microphone.
f. Include base microphone as standard option.

Forgetting the last two items (e and f), we estimate that the additional cost to Philips for these alterations would be:

a. No cost — in fact they would save the cost of one resistor (about 0.5 c).
b. Should cost less than $1 to replace rear panel with one including heat dissipating fins.
c. Costs about 50c. to replace F connector with BNC type at the factory.
d. Scanning facility should cost about $1 in parts plus a few cents for outboard PCB until the main board could be replaced. Assume overall cost of $2 which is very generous.

The total cost of these four items is $3.50 — not a large amount of money however you look at it.

The last two items on our list would be well covered by having a new model with an appropriate increase in price. The market would probably stand an increase of $70 for a base station version of the FM 320 and this would easily cover the costs of manufacturing a new cabinet, fitting a power supply, fitting the receiver mods and supplying an alternative microphone.



Of course, development and tooling costs would have to be included in these figures but we still feel that most CBers would accept a $5 increase in the price of the mobile FM 320 and would be prepared to buy an FM 320B base rig for, say, $370 (RRP probably $390).

We feel that Philips could supply a base station microphone for the FM 320, as an option, for less than $15 though we would not be looking at a power amplified unit.

So there you have it. With a few extra dollars spent on the 320, a whole new world of CBing could be opened for the UHFers.

C B A

TOP: Assembly line worker at Philips' Clayton factory fits the front panel PCB board. Gadget in the girl's hand is an electric screw driver.

BELOW: A Philips' employee operates the 'brain' used for all final checking of two-way radio equipment. The 'brain' costs over $80,000 and is composed of Hewlett-Packard test equipment.

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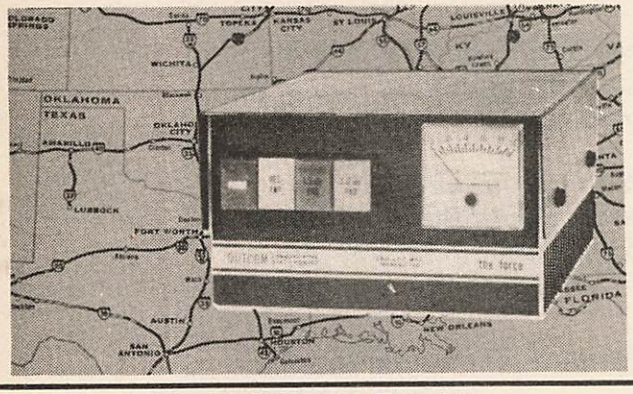

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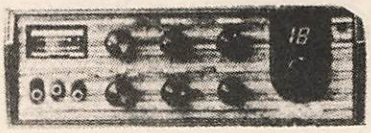

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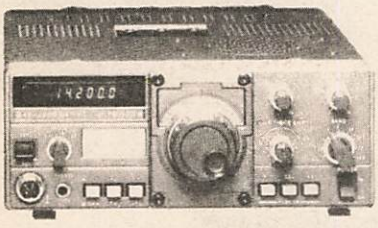

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Construct your own radio shack

Radio shacks are becoming more common among CB operators; planning and building a shack can be an interesting and enjoyable experience, and makes CB radio a better and more rewarding hobby.

by David J. Flynn

While Webster's New International Dictionary defines a shack as a 'shanty — a small, roughly built hut', very few radio shacks, either amateur or CB, would fit this description.

Many CB enthusiasts, having established CB radio as a major hobby, have developed quite handsome and comfortable shacks. Doubtlessly, as the CB scene calms down, greater numbers of operators will consider defining a certain area in their house or garage as a radio shack — and a little planning will contribute towards an enjoyable hobby, especially where a radio shack is concerned.

As a starting point, the location of the shack must be decided upon. Many people have already solved this question, and have reserved a corner of the bedroom — or a spare room, in the case of the more fortunate.

Shacks behind the garage may be truly isolated and separate from the more mundane matters of life, but can be troublesome in terms of comfort especially when heating must be considered. Still, many 'garage-shacks' are almost self-sufficient worlds of their own, harbouring the essentials of modern life (biscuits, coffee, and a portable TV set).

Depending on the style of the house, there might be room enough in the roof for a small shack. An apex of around 8 feet (2½ metres) will allow headroom for all but the tallest operator or visitor; however, the sides of the roof should not possess too steep a slope. As long as you can stand up and walk around without crouching, a cosy attic can be built — a small steel ladder, descending from a point where vertical attic space is around 5 feet (1½ metres), will give easy access to the shack. Note that an in-roof shack can give a great view, and significantly reduces the cable run length from the equipment to the antenna, increasing station efficiency, especially for UHF operators.

Once a location has been selected, a suitable resting place for the equipment must be found. Good, solid workbenches are fine in a backyard shack or perhaps in an isolated room, but their lack of 'finish' can be detrimental to an otherwise neat and well-decorated room. Home-built shelving or benches can be quite cheap, but you should know what you are doing, otherwise unstable and badly-crafted benches can result.

If you have a certain design in mind (and you should!), but fear a shoddy outcome from handyman jobs, the plans can be passed on to a carpenter who will not only tailor the bench to your specifications, but might suggest a number of improvements to your design.

continued on next page

Failing this, there are two avenues left to explore: second-hand office equipment stores can yield extremely good desks — solid, stylish, and very functional, even if the cost is somewhat higher than other alternatives. Otherwise, store-bought desks and chests are the answer — their designs vary enough to allow at least a few units that suit your needs.

The table should be deep enough to accomodate all the gear owned, and still allow space at the front for log-books, note pads and likewise. It should allow the legs to move comfortably under the bench, without bumping into walls and supports. While store-bought equipment will almost always have room to store magazines, books, patch cords and the like, home-made benches should at least have a long shelf below the table surface.

After this comes the operating aspects, including chair height and style, and positioning the equipment. The chair should be comfortable and of the correct height, so that you do not need to reach up to the gear, and can rest your elbows on the desk — not only in an upright sitting position, but in a typical 'schoolboy slouch! At all times there should be little strain, and therefore little fatigue.

If you go in for operating in long stints, a base microphone is very useful. These can be picked up at quite low prices, especially if second-hand. For the more avid experimenter, VOX (voice-operated transmission) is the ultimate in operating luxury, but you might find yourself being 'cut-off' if you pause for too long, and thus start to develop a habit of saying "aaahhh" to keep the VOX open.

The next aspect of the shack involves heating and lighting — although fan-boosted heaters are quite effective in warming a room (and many have a 'fan' function to cool the shack in summer), they often cause AC hum, which is solved best by using separate fuses for the heater and the radio gear. 'Blower' heaters can also make a room stuffy if there is not sufficient ventilation. Regular bar heaters might be slower in warming the shack, but are adequate for the job.

The best lighting is provided by a hybrid cross of natural and artificial light — the natural light is best given by two windows, giving light from behind and to one side.

A single, long window is best utilised by setting the equipment up on a corner bench, running into the corner nearest the window and then along a wall perpendicular to the window.

Fluorescent tubes overhead, combined with a small, flexible stem desk lamp at the equipment itself, will afford optimum lighting when combined with a window's light.

Do not over-tax a simple power-point with a mass of double-adaptors — either get an electrician to install a new outlet for the station in close proximity to the equipment, or, perhaps less expensive, obtain a remote board of three or four outlets that derives it's power from a single outlet via an extension lead. If this is to be done, make sure that the length of cable supplied will run from the 'mother' point to the station — many such 'power packs' come with barely a metre of flex. Most hardware or variety stores sell such power packs.

The best solution would perhaps be to have an electrician wire up a number of extra power points at the equipment site, and put these on a separate fuse. This action prevents overloading existing lines and lessens the chance of interference from other devices on the same fuse, such as the previously mentioned fan-boosted heater.

Before setting up the immediate station area, thought must be given to some form of sound-proofing. This is most easily accomplished in a small, separate radio room. Cane-ite is not exactly the prettiest looking wall material available, and thus although it is excellent for noise-proofing, it is best relegated to the separate shack, where decor is less important than in bedrooms.

Cork tiles are effective sound deadeners, and look suave and sophisticated; they are, however, equally expensive. Remembering that all surfaces — not only walls, but ceilings — conduct sound, the outlay can be quite high. Never-the-less, other members of the household should not be forced to share in your hobby because the sound carries through the walls of your room.

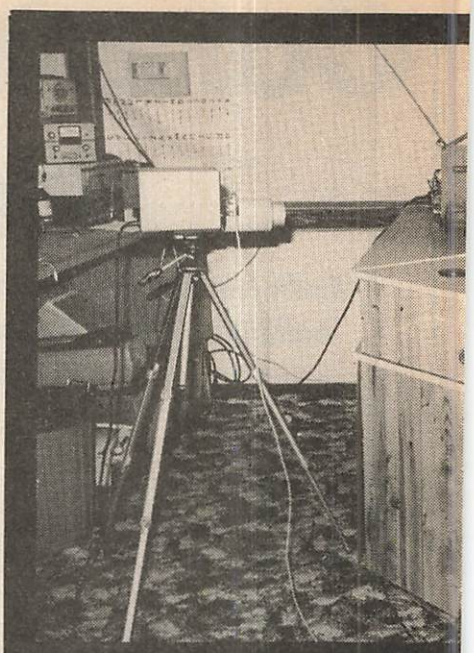
Consideration for others should be one of the main concerns in establishing a radio shack. A garage add-on or an attic shack is often a pleasing alternative to large expenses involved in cork tiling.

Now comes the most enjoyable part of setting up a shack — dressing up and putting on the final touches around the station. You should always have a clock of some sort at the station as a time reference. Very cheap LED clocks of small size can be found, most with an alarm that can be used to remind you of a scheduled contact, the arrival of dinner on the table and sundry other events of world-shattering importance. Other digital clocks with leaf or rotary movements will suffice, and , unlike LED displays, are not 'washed out' by direct sunlight from those windows behind you and off to one side.

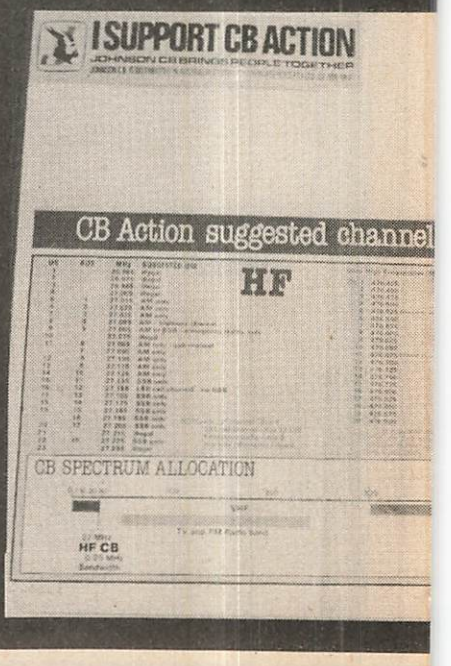
Another excellent addition to the shack is that of a 'notice board' — a large piece of Cane-ite (around 2' by 18"), suitably framed, can hold your licence (you do have a licence, don't you?), a list of channel usage and Q-codes, etc., while a number of QSL cards add some colour to the station.

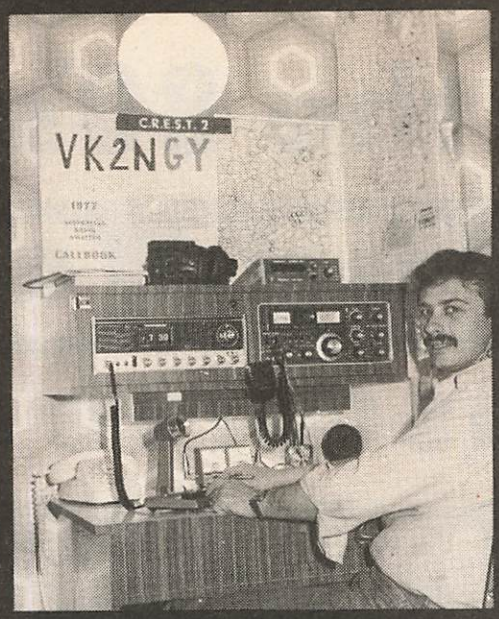
It is also very effective and eye-catching to construct your callsign in adhesive lettering at the bottom of that board. Tandy Electronics stores sell a large sheet of 82 letters and 22 numberals for $2.99, leaving many left-over letters. If a number of friends are interested, you can contribute equal shares for the cost for a single sheet, to cut down on unnecessary buying.

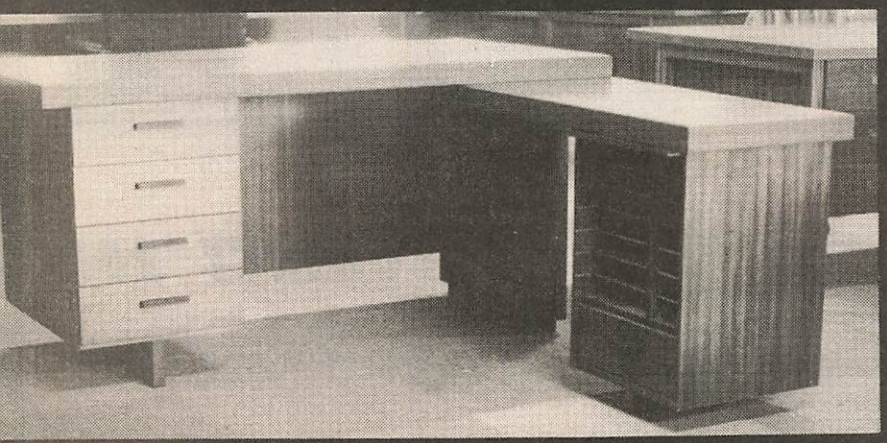
To save constant loss of pens from the table by people who borrow pens for 'just a minute', an adhesive pen mounting and curly-cord pen, such as those used in banks and post offices, is not only practical but it adds a touch of class to the station. Most stationery supply stores have such pens at a low cost.

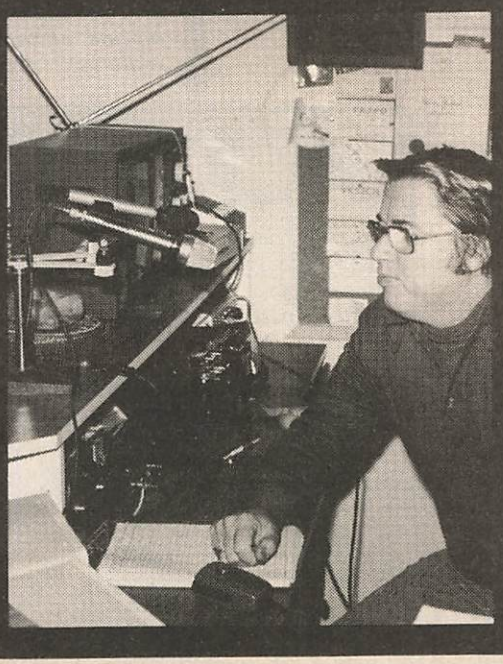


ABOVE: Ham radio operators gener spend more time and effort on their sha In this case, the operator VK3YII amateur television (ATV) and his shac seen right throughout Melbourne.
TOP RIGHT: Frank Gaenslar operates b ham and CB stations in Sydney. His sh is simple but efficient.
RIGHT: Office desks can enhance not the look of your shack, but also offe excellent working area.
BELOW: Notice boards can be handy keeping important information close hand.
BELOW RIGHT: Close up of VK3YIIs tion showing the profusion of mi phones.









If the shack is located in the backyard or the roof, an intercom saves much time and trouble in relaying messages by foot to and from the shack, especially in wet weather. Intercoms can by purchased from most electronics stores from as little as $14, and even less as kits.

To finish the station area, a sheet of glass over the table will give a solid writing surface, and can allow channel usage charts to sit below the glass — they don't get grubby or dog-eared, and the over-all effect is very neat.

Now we look at additions to the equipment.

An extension speaker can give quite an improvement to the aduio output quality of a transceiver, even a base station that uses an in-built speaker facing the operator. The most suitable speakers include the standard extension speaker, sold by most CB stores at around $10, and (for a home-made job) a number of car radio speakers will enhance the audio. The car radio speakers should be mono, not those used for stereo cassettes or FM radio.

Many operators construct a small 'remote' socket box which consists of a standard hardware box (from most electronics suppliers) housing a pair of headphone sockets connected by a wiring lead to the 'Ext. Speaker' socket behind the rig. The remote unit can sit in front of the operator to save straining headphone cords, while the auxiliary socket enables a visitor to listen in. If you have no headphones in the house (or not a spare set), reasonable quality 'phones can be bought for around $10 at any electronics store.

Of course, now that the shack has been set up, you want to protect it and keep it as your property." Curtains over the windows will keep out the overly curious eyes, while the windows should possess solid locks. Likewise, the door of the shack should be fitted with a lock, especially if the shack lies in a separate room. This keeps out intruders of all forms, from burglers to those bratty young cousins.

The serial numbers of all equipment should be recorded, and kept somewhere other than the shack, while a small engraver can be used to personalize gear by writing the callsign and perhaps phone number on the rear plate of the equipment. Such engravers, at around $3 each, are a cheap precaution against resale of stolen goods, and can lead to their return. Once again, a few interested friends pooling together will lower the cost to each individual.

Some electronics experimentors, when leaving their station for any lengthy holiday, set up an infra-red emitter/detector system that will alert neighbours to any would-be burglers. Strategically placed across a doorway or behind a window, they are the final safeguard against illegal intruders.

So now that you've got some ideas of where to start and what to aim for, look at the possibilities of your own radio shack. A 'roughly built hut'? Mr Webster would turn in his grave! C B A

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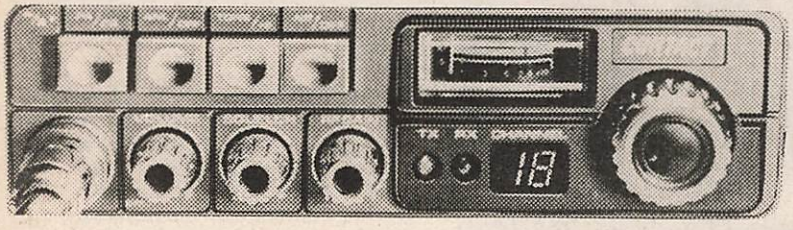

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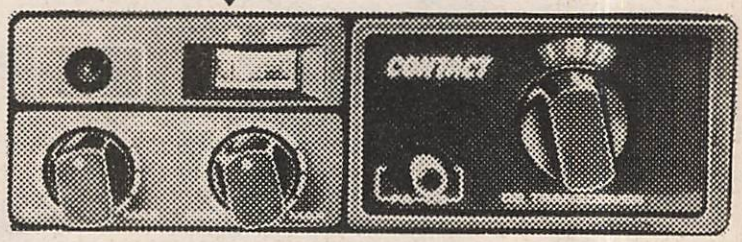

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10-34

If you've got a problem to be sorted out or want advice, the 10.34 column is where you'll get the answers. Write to our technical expert c/o CB ACTION, P.O. Box 628E, GPO Melbourne, Victoria, 3001. Enquiries are for publication only — no personal replies.

WHAT IS HAPPENING?

I am thinking seriously about buying a CB-590 Electrophone base station but I am not sure what is going to happen in 1982 regarding 27MHz CB. Could you please tell me what this is all about?

Michael,
Wollongong.

The original plan was to legalise CB operation in the eleven metre band for a limited period ending in 1982 when all CB activity would magically discontinue on that frequency and transfer to the UHF allocation of 476 to 477MHz.

From the very outset of legalisation, it would appear that thousands of CBers were not backward in announcing their firm intentions to continue working 27 megs come hell or high water. In simpler terms "we ain't moving".

Several events have occured in the interim. UHF has become a reality and although widely rejected at first — mainly because of unfounded rumours to its inadequacies — its popularity is now increasing with leaps and bounds and we are experiencing what might be termed a 'mini-boom'.

When Mr. Staley took office as the minister for Post and Telecommunications he ordered an investigation into the feasibility of retaining the 11 metre citizens band after 1982.

The results of said investigation have not to date been released and we are not even sure that it has been completed. However, we feel that there is a fair chance of retention after the affixed date for removal of the service.

Since 27 megs was originally obtained by the 'squatters rights' method and many thousands of stations were using the frequency before legalisation — a loss of revenue to the government — it only stands to reason that present operators are not going to easily accept an order to quit when the time comes around.

Having given a brief outline of the situation as it stands now, the answer to your question is simply this, "we don't really know either".

TWO ON ONE

I would like if I can mount a three element Archer beam on the same pole as my DPX-2000 without them interfering with each other. I have a 60' tower with a length of one inch galvanised pipe on top. There is nine feet from the top set of guy wires to the antenna's radials. I would like to mount the beam just above the top set of guys which would make it about 8' 10" below the groundplane. Also, would I get interference from the top set of guy wires.

Unit — 17
Portland.

Your only answer to a situation such as this is to mount the beam for horizontal polarisation — you probably have this in mind anyway.

There would definitely be some interaction between both antennas and the guy wires, but it is difficult to determine the exact amount without experimentation.

If the guy wires are mainly in the vertical plane, interaction will not be very marked, however, if the main component is horizontal they could tend to skew the beam's main lobe up in the air — an undesirable condition.

Since both antennas are resonant constructions, there is a chance that the presence of one will enhance the others performance in the horizontal mode with next to no effect in the vertical plane.

Depending on the relative orientation of the guys, you may find that your beam will exhibit different gain and directional characteristics through different segments of arc.

Essentially, I suggest you give it a try. There is no doubt that it will work — and probably quite well.

PARABOLIC DISH?

Having purchased both CB Action and its sister publication ARA since issues Nos. 1, I have from time to time seen mention of parabolic dish antennas in reference to VHF and UHF installations and have often wondered about the principles and methods concerned in their construction and use.

If space permits, could you give the basic principles of operation and practicability of these antennas for use on the UHF and HF CB frequencies? Maybe this subject would provide an interesting topic for a technical article in a later issue of this magazine.

Colin Clark,
QLD.

Certainly an interesting enquiry and one frequently discussed at length on the bands, however, in most cases quite out of the question for use by CB operators for a variety of reasons.

The suggestion of a full length article on the subject sounds good to us and we will seriously consider it for a future issue.

Parabolic passive reflecting dish antennas are an exciting subject but unfortunately one which has suffered gross exaggeration and imaginative influence from within the CB (and other) ranks.

Practically, they are difficult to build, however the operating principle in itself is quite simple to understand. A parabolic reflecting dish, as its name implies, simply serves to concentrate the radiation 'illuminating' its surface to a focal point usually some distance in front of the dish where an appropriate antenna is mounted. In this way almost all the radiation falling on the dish's surface is concentrated onto a smaller antenna which then feeds the apparently amplified signal to a receiver.

The same principle applies for transmitting but in this instance, radiation from the antenna is captured by the reflector and redirected in a narrow beam dictated by the heading direction of the dish.

Those familiar with the reflecting mirror telescope will see that both systems are essentially identical except they are designed for different frequencies, i.e. light is just another form of similar radiation.

There have been staggering gain figures quoted for parabolic reflecting antennas and, while in essence they may well be correct, they should be accepted with some reservations.

For example, the Arecebo radio telescope built in a volcano crater in South America has a gain of more than 60dB at a frequency of 700MHz. At UHF CB frequencies (around 500MHz) the same antenna falls a little short of 60dB. Therefore, the effective radiated output power for a five watt input signal would be in the order of 5,000,000 watts. Yes that's five million . . . a substantial gain we all agree. There is however, one minor point to consider before setting about building such an antenna — that of size. The Arecebo antenna is 1,000 feet in diameter and cost millions of dollars to construct.

If we now consider a more practical size antenna, about six feet for example, its gain at 500MHz will only be in the order of 12dB and you would be far better advised to build a conventional beam.

It can be seen from the above two examples that gain is proportional to size and small dishes only perform well at frequencies of 1,000MHz and above.

Although a 10 foot dish will perform quite well at UHF CB frequencies the size becomes very difficult to handle.

At 27MHz, you could write off a 10 foot dish as being worse than useless because its size is far less than the signals wavelength and a half wave dipole would perform more reliably on its own.

On Colin's suggestion, we'll look at reflecting antennas much more closely at a later date. In the mean time, consider the practical aspect before setting about a 'parbolic' project.

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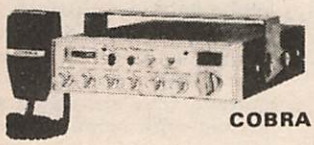

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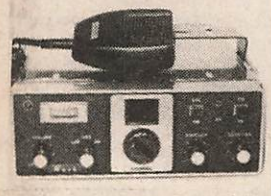

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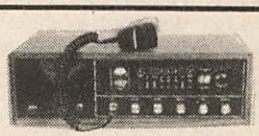

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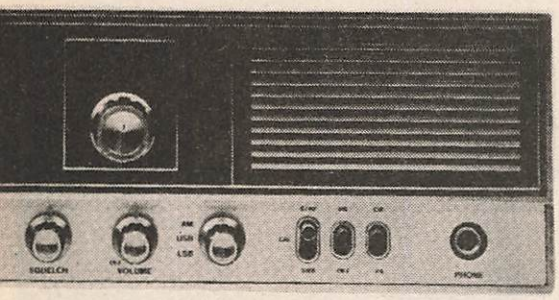

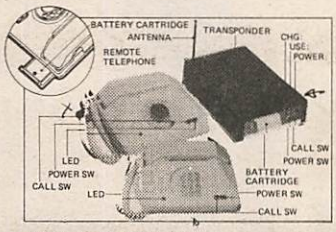

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When the chips are really down in an emergency, is the Harbour Marine Radio Service as much value as it was originally intended?

This is a question that many small boat and sailing craft owners must be asking with increasing frequency after the service has failed miserably on several noted recent occasions. Failure of emergency radio services however, is not restricted to those in the 27MHz spectrum as a prominent recent case clearly demonstrates.

Many readers will remember how a crewman on a fishing boat about five miles off the coast of Tasmania recently lost his life after suffering a badly fractured skull in an accident aboard ship.

A very sad aspect of the drama — aside from the loss of human life — is that immediately after the accident, other crewmen sounded the alert using a recognised distress frequency — many megahertz away from the citizen band allocation — and in doing so pressed into service radio equipment specially designed for emergency use and incidentally, costing probably ten times the value of most SSB CB transceivers. The type of gear which seamen procure, at great expense, for their personal safety — and it really works.

With little difficulty the alarm was raised and that great, efficient bureaucratic machine designed specifically for sea rescue exploded into unparalleled action. One hour and thirty minutes later, the accident victim died. In simple terms, he hadn't stood a chance from the beginning.

Why?

The system only allows for numbers . . . people are just a little out of reach.

At the time of this man's death, the wheels of savior were slowly turning. The country's national capital had been notified of the accident, while, in the mean time, crew members stood by anxiously waiting for a police whirly-bird to swoop from the sky and whisk off the critically injured man for proper medical care.

In fact what really happened was this. Four hours after the distress call was registered, a police helicopter was finally despatched to effect a rescue. It is only a point of history to record the victim's life functions had been extinct for two and one half hours.

We'll never know whether prompt action would have saved his life, or if a distress call via CB radio would have made three hours difference. Unfortunately, hind sight won't produce the answers unless we learn a lesson for the future. If this was the only case, it would still be little to be proud of, but it isn't. Recent history is punctuated with dozens of such cases where an efficient rescue service might have saved the day.

Let's get right down to the nitty gritty and examine the facts as they stand indicting safety and radio communications.

What is available for a mariner who goes to sea for pleasure or livelihood?

We've already discussed a system which appears to have one obvious downfall. Although communications are reliable and immediate — from the previously stated example — the chances are that you might get prompt attention but, on the other hand you might have drowned four hours before help arrived. On present record, not very encouraging is it?

HARBOUR MARINE
Friend or Foe?

You would also be up for a pretty sizeable outlay to get started. For the average CBer/boating enthusiast with minimum resources it's 'not on'.

There are two services designed for the 'weekend' sailor. One is relatively new on the scene and involves a number of authorised channels in the VHF area. Probably quite a good service but still with a couple of hang-ups however. Transceivers for this service cost in the vicinity of $600 and while this may be considered minimum investment for the cost of one's life, there are many pleasure craft sailing regularly without even the minimum compulsory legal safety gear aboard.

As for its operation, we have no information to hand which either reinforces or negates the reliability of this service in an emergency situation. We must therefore regard it with some scepticism until proven otherwise.

There are two pretty obvious alternatives not yet approached here, and they are — 27MHz citizen's band and the Harbour Marine Service. Let's look at Harbour Marine first and see how effectively it performs a service.

Harbour Marine could be a 'great' service for small boat owners if it weren't for two major stumbling blocks. The first is that of interference from 27MHz CBRS signals. This is a very real threat to users because lack of rigid specifications in transceiver manufacture allows channels (old US channels) 1, 2, 3 and 4 to completely blanket anything weaker than strength 9 plus.

The fact that CB operation on these channels is illegal in Australia really has little bearing on the subject. Thousands of normally responsible citizens are either ignorant of the potential damage caused, or believe that laws are made to be broken. In fact, the interference problem in this case is purely technical and could be remedied by sensible manufacturing regulations thus leaving the public at large with no blame and therefore no restrictive laws to break without knowing why.

Secondly, Harbour Marine — assuming no interference from CBRS — might easily save lives providing you always stay within range of Home Base or friends who know your voice and call-sign. In any other situation, a distress call will be undoubtedly viewed with some suspicion and therefore chances of a speedy rescue mission being launched are adversely affected. With the right equipment your chance of interference free communications are considerably improved — but it must comply with a few sensible and relatively cheap to incorporate specifications.

We won't dwell on what they are in this article, but it is sufficient so note that we view 'your' average Harbour Marine radio as a distinct liability in the face of danger.

Now, let's examine the most maligned and discredited radio service in the history of the human race. This service has been the subject of so much bad and inaccurate media coverage that at least 70 per cent of Australia's population shudder at its mention.

Sure there are a bunch of whackers irresponsibly broadcasting on the air and for our money, many of them need their arses kicking, but it would be also irresponsible to consider all CB operators 'tarred with the one brush'. Naming CBers 'idiots' as many of the enlightened are quick to allege, is the same as claiming that gravity causes objects to fall upwards. Under the surface of even the biggest nuisance on air is usually a pretty decent sort of guy or gal just waiting to be let loose. In fact, emergencies have a way of turning even the worst of earth's criminals into heroes and heroines. Take a quick look through the history books and see for yourself.

CB radio may not offer much to a weekend sailor who wants to check-in with mum at home. If he or she is well known to the local operators chances of communication are much better, however, in other situations they will probably get blasted off the map. If a user becomes beligerent, chances are it will be returned in kind, and those are the facts. On the other hand in an emergency, a distress call can be heard by practically any station, and that means any occupied channel, and within a matter of seconds there will be so many potential heroes and heroines to hand that a victim couldn't count them let alone thank every individual for his or her part in 'saving the day'. The CB radio network now covers the world so thoroughly that there is no nook or cranny which cannot be penetrated. Channel occupancy is so concentrated that it is virtually impossible to escape CB radio signals in any part of the world. We'll be so bold as to state that if only one life has been saved through the use of CB radio since its introduction, it can justify all the TVI ever created — which incidentally is rarely the CBers fault.

Now, without the melodrama, let's evaluate the pros and cons of the two most likely emergency services, 27MHz CB and Harbour Marine 27MHz.

CBRS

ADVANTAGES

1. Excellent coverage via direct and ionospheric propagated wave conditions.
2. Band occupancy is high 24 hours a day.

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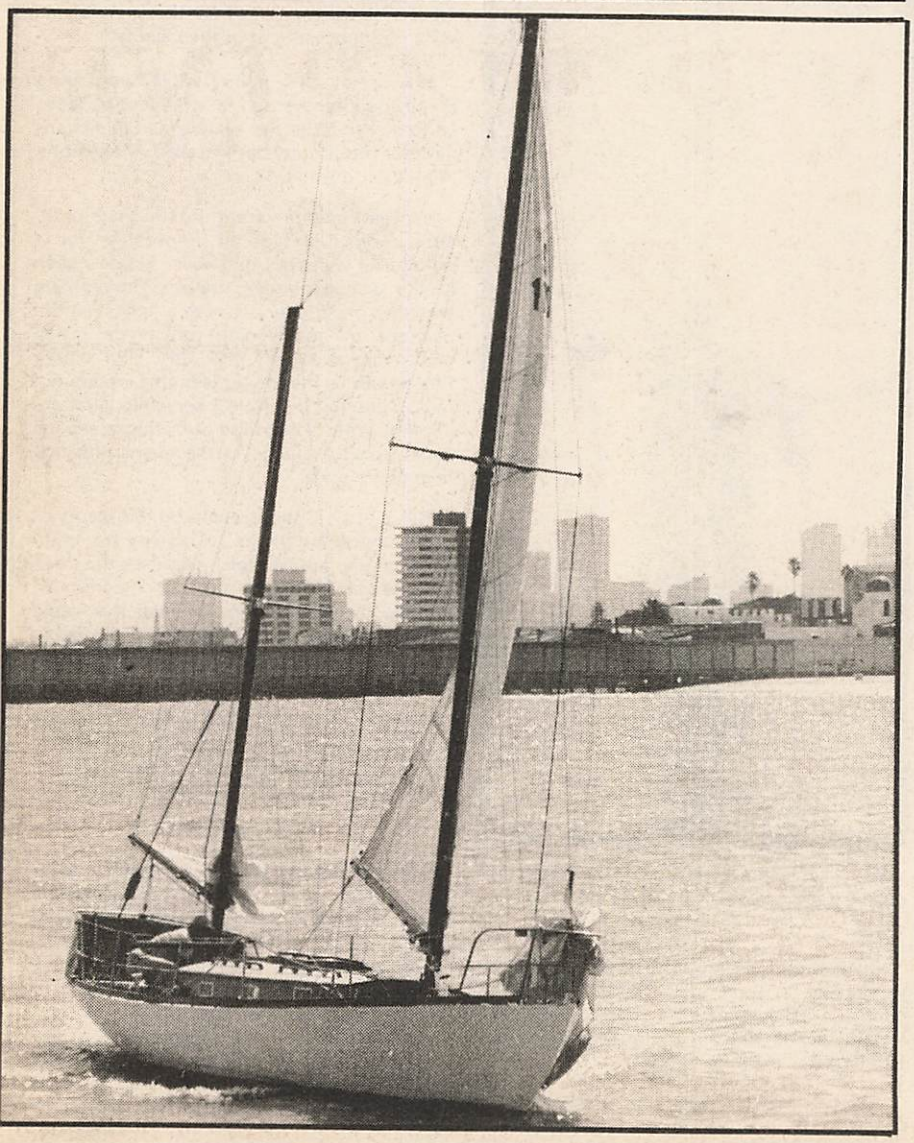


3. Operators are enthusiastic — especially in emergencies.
4. Transceivers are cheap and readily available with good specifications.
5. Transceivers are not easily subject to interference other than overload.
6. Transceivers are rugged and reliable with no special skills required to install rigs or antennas.
7. Although credibility is poor, operators are frequently able to take direct action.
8. All common channels are supplied with the transceiver.

DISADVANTAGES

1. Operators suffer credibility problems with the authorities.
2. Band is congested and normal conversation may be difficult.

HARBOUR MARINE

ADVANTAGES

1. Prearranged communications conducted with ease — range and conditions permitting.
2. Service dedicated to marine communications.
3. Frequencies monitored by coast guard — limited hours of operation.

DISADVANTAGES

1. Low rate of occupancy — in bad weather or unusual hours communication chances decline dramatically.
2. Subject to heavy interference in areas of high CBRS activity.
3. AM mode only permitted — less effective than SSB transmissions.
4. Credibility better than CB but not substantial.
5. Crystals not supplied with transceiver — extra cost to operator.
6. Frequencies subject to change without notice — two new channels added recently and one old frequency removed.
7. Less facilities and value than normal CB — not cost effective.

Considering the above check list it becomes obvious that both services offer advantages and disadvantages which are not well aligned. Both modes show distinct inadequacies of one kind or another, however, for our money, we'll take CB any day and put up with the limitations.

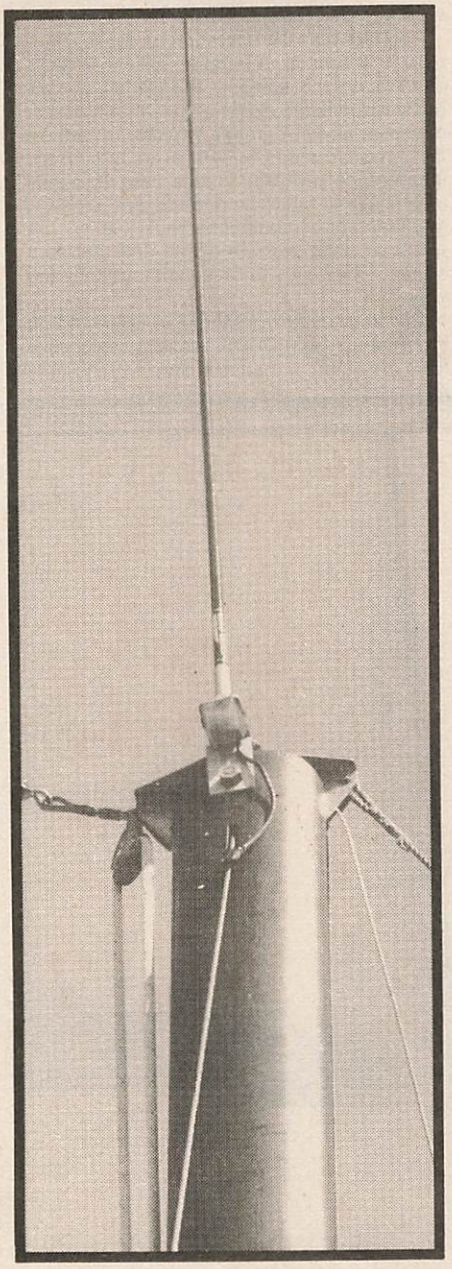
Rationalising both services, there is another, and more satisfactory conclusion to be drawn when safe boating is a must. Instead of selecting either mode alone and settling for a compromise, install both modes for cheap insurance. It might sound extravagant but you can still install both services for less than $400 and have the best of both worlds.

Recently we had the good fortune to meet a sailing enthusiast who, not wishing to put all his eggs in one basket has done just that and installed both communications services equipment in his yacht — and for a very good reason.

Every day of the week, Bill Van der Leeuw, proprietor of Melbourne Sailing School takes the lives of a dozen of inexperienced pupils in his capable hands. His operation is based at the St Kilda Marina near Melbourne where three times daily he sets out against the wilds of Port Phillip Bay in his all steel 28 foot ketch 'Asteele' — come rain, hail or shine.

Asteele's antenna system is slightly different from most.

A quarter wave mounted atop the mizzen mast employs a standard mobile base potted in epoxy resin for weather-proofing and attached by a right angle bracket. The aluminium mast becomes substitute for a ground plane and lowers the radiation angle.



Bill is proud to be owner of the only living version of a steel hull Herashoff H28 in captivity — they're usually wood or fibreglass — and it isn't difficult to imagine how the name 'Asteele' came about.

Bill runs a taut ship and takes no nonsense from his pupils because safety is always uppermost in his mind. Adding to safety is the yacht itself; a legendary design which has proved to be a 'round the world sailer' on many occasions, but Bill still leaves nothing to chance.

On board he carries two transceivers, an 18 channel Bushranger CB rig and his faithful old Sanyo 6 channel Harbour Marine — therefore keeping the odds balanced well in his, and most importantly, his crew's favor.

Bill gave us a demo of the two rigs for comparison. The Bushranger sprang into life with all channels showing the usual occupation. However, the second unit was also aflame with action on all 6 channels. We reeled a little at this and decided to investigate further.

The marine radio was blasting out SSB stations from all angles and this didn't appear quite in order. In fact, apart from the heterodyne of several AM stations underneath the 'duck-talk', one sideband station seemed to be getting into all channels. You might say this can be easily explained by a close-by station getting into the rig through overload. A good theory, but at that stage we were at least five miles from the nearest land with not another boat in the vicinity.

It was at this point, while wondering about the interference, that Bill just happened to mention that we were tuned to a channel that had no crystal installed. Makes one think a bit doesn't it?

We had been aware of interference problems with this type of transceiver for a number of years but had never actually seen it with such resounding realism. The problem wouldn't occur way out at sea, however, the chances of summoning assistance in an emergency wouldn't rate very high either. Perhaps Bill's marine rig is faulty, we are not really sure, but it certainly serves to illustrate another great advantage of having a second back-up rig available in the event that one fails completely.

Bill is not a CBer as such. He has plenty of other important things to occupy his mind while at sea, but he well recognises the need for possible reliance on radio communications in an emergency — and that rates pretty damned high with us. It probably makes his pupils feel one step closer to home too.

Summing up, it appears to us that Bill has taken a very sensible approach to the situation and we believe that he deserves full credit for a responsible attitude to his pupils.

★ ★ ★

In the final analysis, it's up to each individual's choice and priorities where marine safety is concerned, and those who place great store in the "it'll never happen to me" syndrome won't be influenced in any way by the facts presented here. We feel however that the story required telling and, YOU the sailor need to know the safest course to set.

Because you are already a CBer, there is no excuse to take your life and those of others irresponsibly in your hands. C B A

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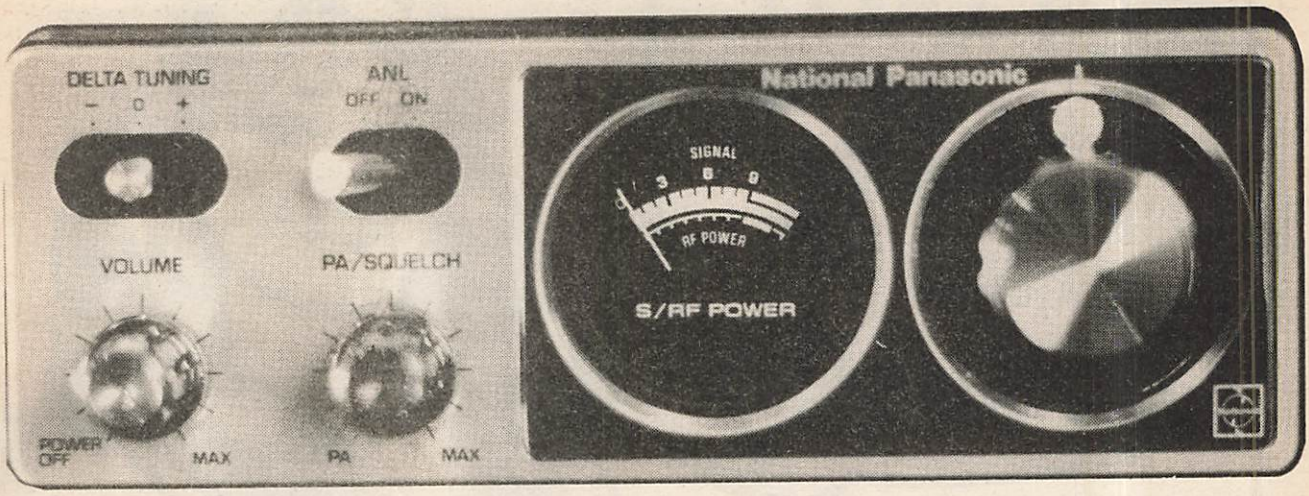
AM RIG REVIEW



National's RJ-3100818

Our CB rig review this month is on the National RJ-3100B18, an 18 channel AM only rig. This rig has just enough control knobs to give the mobile operator sufficient control without being too complicated to confuse the motorist when his mind should be on things other than the CB.

As with other products from the National Panasonic range, the RJ-3100B18 is served up to the consumer with much flair and panache and there is certainly nothing 'half-baked' about the presentation. Unfortunately, the rig we had an opportunity to review didn't quite meet our expectations from an electronics house with National's reputation.

The RJ-3100B18 is a neat looking AM rig which is small enough to fit into the smallest of Japanese cars, but also large enough so that the meter and control knobs are easy to use. As a styling exercise, National's design boys did a good job.

However, the unit's performance did lack somewhat when exposed to the rigors of an average Melbourne evening on the CB. The main problems appeared to be poor selectivity and a poorly adjusted modulation limiter.

Taking the latter case first, we would assume that the rig loaned to CB ACTION for this review had an alignment problem and this might not be typical of the average RJ-3100B18. Unless you had a very loud voice, the slight amount of over-modulation would not cause too many problems in average use.

The receive selectivity problem on the other hand could cause problems for city CBers wishing to connect this rig up to a base antenna. Used mobile, especially away from city limits, the poor selectivity should cause little real hassle.

The only other potential hassle we could find was in the noise suppression circuitry. While we gave this rig a 'fair' in the noise suppression section, it should really have been between a 'poor' and a 'fair'. Unless you have a very noisy vehicle, the noise suppression circuitry should just about handle most situations — Volkswagens excepted!

On-air our testers were quite pleased with the overall performance and the transmitted audio was considered fairly 'natural'. Accurate receive impressions were a little harder to determine due to the continual hash coming through all but the strongest signals. However, when we had a clear signal it was very clear and little improvement could be found by using a good quality extension speaker.

On the test bench, the over-modulation was the most outstanding point. Receive sensitivity was reasonable at 0.9 uV for 10 dB signal plus noise and the output power was a fairly normal 3.5 watts.

In summary, we feel that this rig — with correct modulation adjustment — would suit mobile operation, especially in the country. Maybe the truckies should give this rig a try.

C B A

TEST EQUIPMENT: B&K Signal Generator, model 2040; B&K CB Servicemaster, model 1040; B&K Frequency Counter, model 1827; Trio 5 MHz Oscilliscope, model CO 1303D.

Power supplies: CB ACTION 'Budget' 4 amp power supply; Ferguson 'Husky' 2 amp power supply; Technico prototype 2 amp power supply.

Metering: AWA 'Voltohmyst' VTVM: Dick Smith Q1136 100K ohm/volt multi-meter.

GENERAL OPERATION ASSESSMENT	EXCELLENT	GOOD	FAIR	POOR
Appearance		★		
Transmitter 'on-air'			★	
Receiver 'on-air'			★	
Noise Suppression.			★	

NOTE: Comments made by the reviewer or tester only pertain to the actual rig under test and are not necessarily applicable to other units of the same make or model number.

National's RJ-3100818

Make:..... National
Model:..... RJ-3100B18
Supplied for test by..... Mobile One, Sydney
P & T Approval number:..... TBA
Price as Tested:..... TBA

MANUFACTURERS SPECIFICATIONS

Modes of Operation:..... AM only
No of Channels:..... 18
Weight:..... not listed
Dimensions:..... not listed
Frequency Control:..... PLL
Supply Voltage:..... 13.8 VDC

TRANSMITTER (handbook details)
RF Output Power:..... 4 watts
Modulation:..... 90%
Spurious Suppression..... 50 dB down

RECEIVER (handbook details)
Sensitivity:..... 0.6 uV for 10 dB S/N
Receiver Conversion:..... not listed
Adjacent Channel Rejection..... 55 dB down
Image Rejection..... not listed

TEST REPORT

Name of Tester:..... Graham Pockett VZ3Y3
Rig Tested..... National RJ-3100 B18
Serial number:..... A001566

RESULTS AS TESTED
Test voltage:..... 13.8 VDC

TRANSMITTER
RF Output Power:..... AM 3.5 watts
Modulation Percentage:..... AM (1,000 Hz) 100% plus
Frequency Accuracy (5 minutes warm up):..... + 50 Hz
Mike Sensitivirty at 1 Metre:..... Modulation % AM poor

RECEIVER
Sensivity:..... AM 0.9 uv for 10 dB S/N
Audio Distortion (AM):..... 10% at 3.5 watts
RF Gain Attenuation: Strength 9 signal reduces to strength..... N/A
"S" meter – 100 uV reads..... 10 dB over 9

HAS IT GOT . . .	YES	NO
PA facility	★	
ANL switch	★	
NB switch		★
Variable RF gain		★
DX/local switch		★
Mike gain		★
Tone control		★
Delta tune	★	
External speaker jack	★	
S/RF meter	★	
Built-in SWR meter		★
TX indicator light		★
RX indicator light		★
PA indicator light		★
LED channel readout		★
Phase lock loop circuitry	★	

RIG PANEL	EXCELLENT	GOOD	FAIR	POOR
Ease of controls		★		
Built-in speaker		★		
Microphone location				★
Channel indicator readability			★	
Quality of control switches		★		
Cabinet construction		★		
Mounting bracket		★		
Hand book information		★		

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GETTING TO KNOW YOUR RIG

Part 3 ~ AM... FM... SSB

Up to now we have discussed AM receiving principles and looked at basic means of generating radio transmitter output signals. Before considering actual equipment in greater depth, let's take a look at the peculiar features which differentiate AM, FM and SSB transmissions.

Most readers will be familiar with the format of AM signals by now as the principles have been described at length on various occasions in this magazine and other publications, so I don't intend to discuss this mode at this stage other than necessary to illustrate comparison points with FM and SSB. Since SSB is most closely related to AM signals it stands to reason that this should be our starting point this month.

Figure 1 shows the spectrum composition of an AM signal which includes the carrier frequency and its two sidebands which are separated from the carrier by the modulation frequency. If the carrier was modulated by a 3kHz audio frequency, the upper sideband will be 3kHz higher in frequency and the lower sideband will be 3kHz lower in frequency than the carrier. It can be plainly seen that there are 3 distinct individual components which go to make up the total AM signal, a carrier and upper and lower sidebands. Therefore, amplitude modulated signals could be just as correctly referred to as double sideband with carrier wave modulation. Obviously, to select only one sideband for transmission — as is implied in single sideband — it will be necessary to remove the carrier and one undesireable sideband leaving us with only one remaining sideband. This is shown in fig 1b

Most CB operators will be aware of the advantages of SSB operation over AM from experience on the band. They are:

1. Greater efficiency
2. More efficient use of spectrum space.
3. Resistance to interference from adjacent frequencies.

Let's consider each advantage on their respective merits.

EFFICIENCY

An amplitude modulated transmission with two sidebands and a carrier frequency is inefficient because it contains two sets of intelligence — one in each sideband — and the carrier which essentially contributes nothing to the information transmission process but consumes a large quantity of power in the transmitter.

The carrier is instrumental in locating the transmission frequency, but once this is accomplished it is no longer required until the signal is detected at the receiving station where it is a simple matter to reintroduce it to demodulate the signal. Thus transmitting a signal but omitting the carrier saves considerable amounts of power.

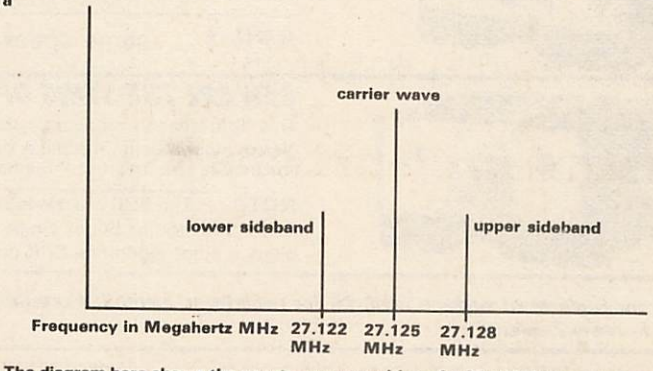
Having dispensed with power wastage in the transmitter by eliminating the carrier we can consider each sideband separately. Looking at the AM modulation 'envelope' in figure 3 last issue it can be seen that the modulating signal is perfectly represented on the upper and lower sides of the carrier and therefore the same modulation is being transmitted twice. Since when we demodulate the signal in a receiver we actually strip off one sideband and only resolve the other, transmitting two sidebands containing the same information is also a distinct waste of power. It is only common sense to remove the unwanted sideband and therefore make a further power saving. This is in fact what happens when we generate a single sideband signal and in the process a considerable power saving is realised. In other words, we have improved the efficiency by using SSB over AM.

SPECTRUM USAGE EFFICIENCY

Because an AM double sideband signal, as shown in figure 1a, is relatively wide spread — over 6kHz in this instance — it is

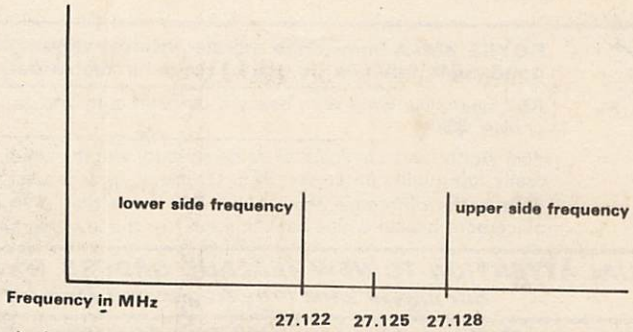
continued on page 49

Fig 1a



The diagram here shows the spectrum composition of a 27.125MHz carrier wave which is amplitude modulated by a constant 3kHz audio tone. Note that each side frequency is separated from the carrier by 3kHz.

Fig. 1b.



Here is shown the spectrum composition of a double sideband signal modulated with the same 3kHz but the carrier has been suppressed. The output from the balanced mixer in figure 3 would appear something like this with most of the carrier eliminated.

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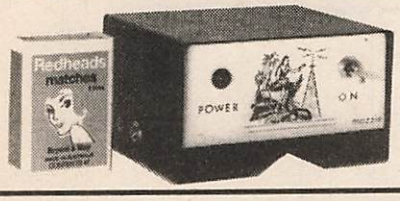

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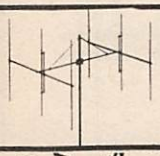

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easily seen that removing the carrier and one sideband will reduce the amount of spectrum space required for its transmission. In fact transmitting a single modulation frequency will require very little 'bandwidth' indeed. Voice transmissions are composed of many audio frequencies and will therefore not be confined to such a small extent — see figure 2. However if we limit the range of voice frequencies to a narrow band — less than 3kHz for example — they will be confined to that very same bandwidth in the transmitted signal.

Although I referred to the extra modulation frequencies earlier as sidebands, when only one modulating frequency is employed it is termed a 'side frequency'. Where many audio frequencies are employed — voice transmission for example — they are then known as sidebands, with band meaning more than a single frequency.

Therefore, when we limit the modulation frequencies to about 3kHz the maximum amount of spectrum space which will be consumed by any one transmitter will be 3kHz or less for lower modulating frequencies. You don't have to be a genius to realise that a similar AM transmission with both sidebands will occupy double the spectrum space.

By the way, this is the reason that a number of manufacturers will quote their transceivers as having double the available channels because two stations can occupy the same channel with minimum interference to each other provided they are using different sidebands of the one frequency allocation.

RESISTANCE TO INTERFERENCE

Any AM operator knows that when two stations attempt to use the same channel, even if the second station is quite weak, the results are a disastrous mess of squeals. The squeals are called heterodynes and are the product of the 'mixing' process referred to in parts 1 and 2 of this series. If the two station transmitters are on slightly different frequencies, their signals will mix together in the receiver and produce our old friends . . . sidebands.

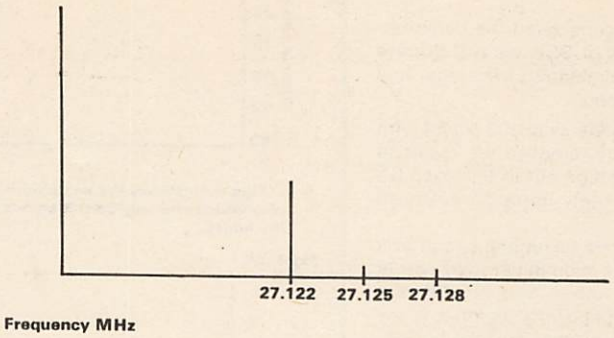
As an example, if one station operating on channel 13 (Aust) is precisely on frequency at 27.165 MHz and a second station is slightly off frequency at 27.166MHz, simple arithmetic tells us that they are 1kHz apart. A side frequency of 1kHz will therefore be generated by the mixing process and since this is an audio frequency, it will be heard through the receiver's speaker as a shrill squeal at that frequency. Add to this the interaction of two sidebands from each transmitter which will also mix, generating hundreds of other sidebands and you have one well known unintelligible squawking mess.

Now consider SSB signals on the same channel and even using the same sideband. There are no carriers to generate powerful single frequency audio interference and only the actual sidebands can mix to create a problem.

Intelligibility will still be poor if the stations are exactly netted (on precisely the same frequency), however, if they are only slightly different frequencies — often only a

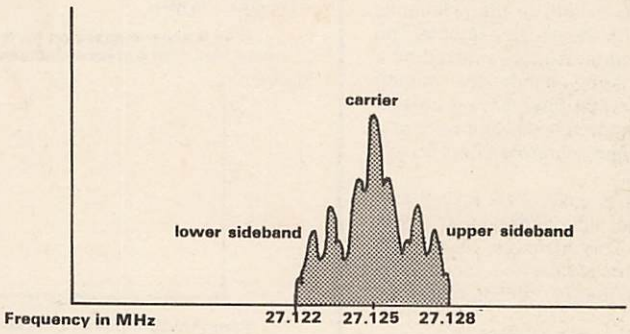
continued next page

Fig. 1c.



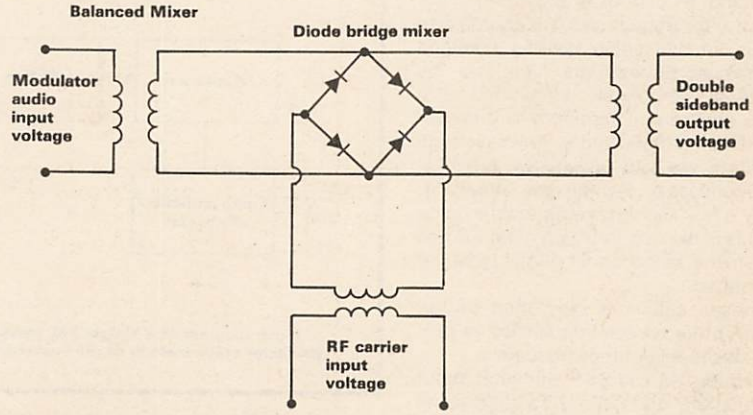
In this diagram both the upper side frequency and carrier have been removed — reduced to a very low level — leaving us with a 'single side frequency.'

Fig. 2



Here we see the same frequency allocation as in figure 1. In this case the carrier is modulated with a range of frequencies — speech for example — and instead of side frequencies we now have developed sidebands in the true sense of the word.

Fig. 3.



Modulation and carrier voltages are mixed in the diode bridge to produce a double sideband output with suppressed carrier characteristics.

If the modulation frequency was 3kHz and the carrier was 27.125MHz — as used in figs 1 and 2 — the output sidebands would be 27.122MHz lower sideband and 27.128MHz upper sideband.

few hundred hertz — it is usually still possible to resolve either station. If they are on opposite sidebands, interference will be minimal unless the signals 'splatter' or overload the receiver.

Now that we've considered the communications advantages of SSB we will discuss the processes for eliminating the carrier and an unwanted sideband.

To produce a double sideband signal with the carrier frequency removed we resort to the use of a mixer stage but in this case we use a specialised variety termed a balanced mixer.

Figure 3 shows the schematic circuit of a balanced mixer. The modulation and carrier voltages enter the mixer through different input ports. Both signals mix together in the diode bridge in the normal manner but because of the diode configuration only the two sidebands from the mixing process are correctly polarised to pass through the output transformer.

The carrier signal is trapped within the circuitry, performing an operation termed carrier suppression. At the output we therefore have a double sideband signal with the original carrier absent.

Assuming that the modulating signal was 3kHz, the total bandwidth of the sidebands will be 6kHz as with the earlier example. The unwanted sideband is usually removed by a highly selective narrow bandwidth filtering circuit. Often a crystal filter having several elements, while many transceivers built to a price employ cheaper ceramic filters to accomplish the task.

At this stage it is easy to be misled into assuming that the sidebands are at a frequency of 6kHz. This of course is not the case. They are actually plus and minus 3kHz of the carrier frequency, which might be 10MHz.

Figure 3 a, b and c in issue 36 shows the filtering operation related to receivers, which is also applicable to sideband removal in transmitters. In this case we would use a filter possessing a bandwidth of 3kHz. With such a narrow filter we can only pass one of the two sidebands.

Figure 4 should make the operation easier to understand. By careful arrangement of the carrier and filter frequencies it is possible to align them so that either desired sideband will be passed through the filter and the other almost completely eliminated. We could use one carrier frequency and switch between two suitable filters, however high quality filters are very expensive and it is more economical to change the carrier frequency by a few kilohertz to obtain the same results. This is the way in which most CB rigs accomplish the selection of either upper or lower sideband.

The chosen sideband may then be remixed with other carrier frequencies to produce any desireable output frequency.

So much for AM and SSB, but what about FM or frequency modulation? To understand frequency modulation it is necessary to disregard nearly all the foregoing information except for the fact that transmissions begin with a carrier wave.

Frequency modulation, as its name implies, relies on modulating or changing the carrier frequency in preference to any form of amplitude variation. Because we vary the frequency in sympathy with the modulation signal FM possesses an enormous advantage over the various forms of amplitude transmission. Since almost all noise interference experienced across the radio spectrum is amplitude modulated in origin, a system which is only sensitive to frequency variations exhibits fantastic immunity to this type of interference.

Now that's a bonus before we even get

Fig. 4 (a)

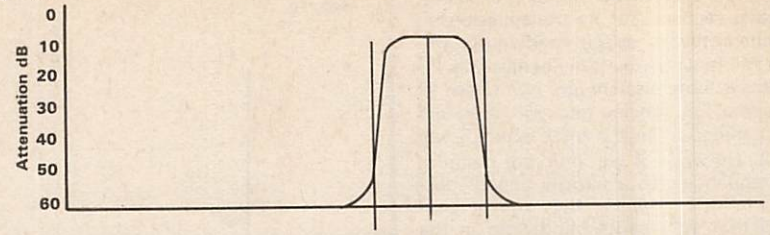
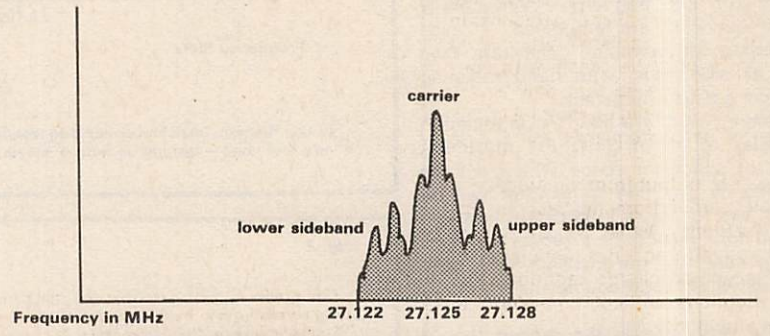


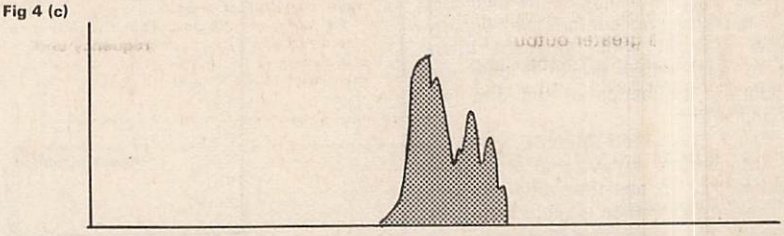
Figure 4a shows the bandwidth of a 3kHz SSB filter. The arch can be imagined as a door way which will only permit signals of 3kHz or less through. A wider signal will be cut off at the edges.

Fig 4 (b)



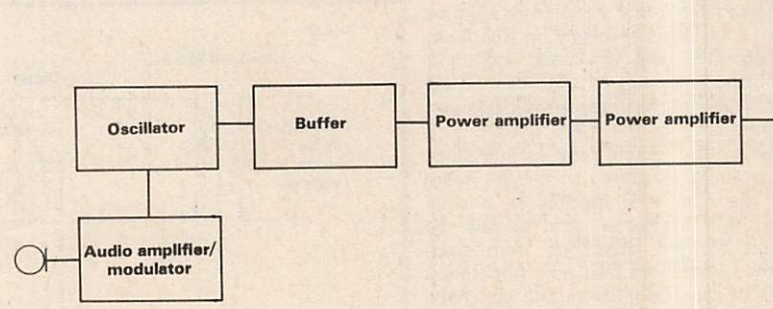
If 4a is superimposed on 4b, it can be seen that only a portion of the signal will be able to pass, and with correct alignment, the figure shown at 4c will result.

Fig 4 (c)



Some AM/SSB rigs use the same narrow filter for AM reception and this is why AM may sound poor in some sets — some of the higher audio frequencies have been eliminated by the narrow passband.

Fig. 5.



Block diagram of a simple FM transmitter. Note that modulation now takes place in the oscillator stage instead of the power amplifier stages as with AM.

started. FM transmissions are also capable of high fidelity — as may be heard from your FM broadcast station — with very little difficulty. It's certainly a pleasure to listen to UHF CB signals which exhibit mainly noise free, low distortion modulation.

Generating frequency modulation is a relatively simple process and requires little in the way of specialised stages or modulating power.

Figure 5 shows the block diagram for a simple FM transmitter. The microphone output is amplified by an audio amplifier and the output is applied to the oscillator stage in the transmitter chain. As we know from last month's discussion, oscillator stages are often quite sensitive to voltage variations. In an FM transmitter the oscillator circuit is intentionally designed to be sensitive to voltage changes, so much so that only a tiny output from the modulation amplifier will change the oscillator frequency by several kilohertz.

In other words, output from the modulator 'deviates' the carrier from its 'rest' or unmodulated frequency. What we are in fact accomplishing with frequency modulation is converting speech amplitude variations into frequency variations without changing the carrier level amplitude.

As you can imagine, a loud noise detected by the microphone will cause a higher output voltage than a softer noise. The modulation amplifier will generate a greater output voltage and thus, when applied to the oscillator, will deviate or swing the carrier further away from its rest frequency.

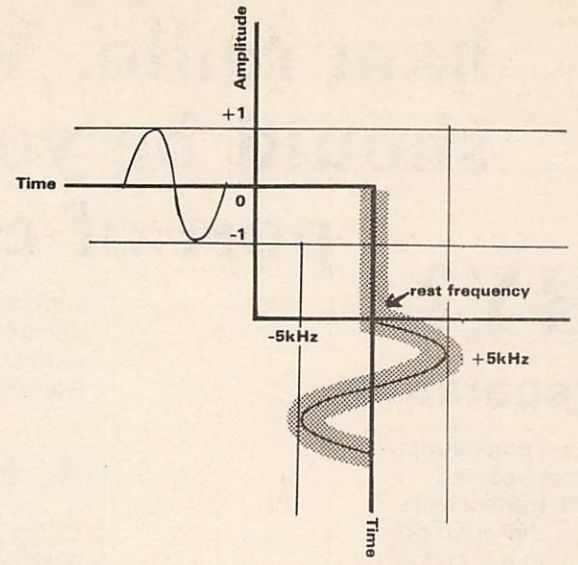
This deviation is proportional to the modulating voltage. The modulating frequency is proportional to the number of times the carrier is caused to deviate from its rest frequency in each second.

Of course the carrier doesn't swing in only one direction and will deviate above and below its rest frequency, following the positive and negative going half cycles of the modulating voltage. Since the oscillator frequency is very sensitive to the tiniest change in modulation voltage it is able to comply very easily. The frequency response of FM transmissions is excellent and limited if anything by the capability of the microphone and modulation amplifier. Figure 6 shows a graphical representation of the conversion of modulation voltage amplitude to frequency deviation.

Detection of a FM signal is more difficult to understand, however it is sufficient to imagine the modulation process in reverse. Stating again that the receiver is sensitive only to frequency variations, in its design there is no circuitry included to detect amplitude changes and therefore no audio output will result from any amount of electrical noise superimposed on the signal. Figure 7 demonstrates this property.

A weak FM signal detected by an FM receiver can sometimes allow some amplitude noise to penetrate the system however this is due to the characteristics of a special limiting amplifier designed into the receiver. A reasonably strong signal should be demodulated completely free from amplitude noise distortion. C B A

Fig. 6.



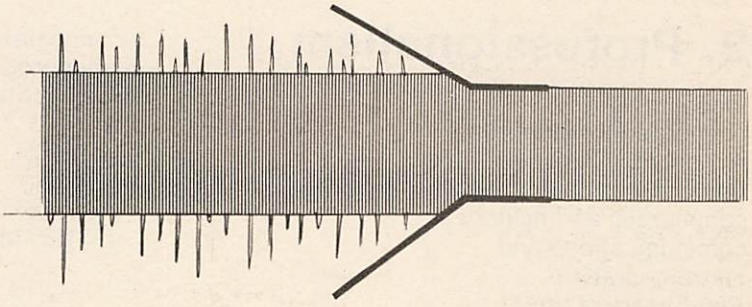
This graph attempts to describe the conversion of amplitude variations from the modulating amplifier into frequency variations. It isn't as tricky as it appears at first sight.

The solid line on the horizontal axis represents an audio frequency sine wave measured on a time duration scale, the horizontal axis representing the length of time.

The shaded line on the vertical axis represents a carrier wave also registered against a second vertical time axis.

By following the time axis around from horizontal to vertical, you will see that the carrier wave remains at its rest frequency until it encounters an audio voltage which causes it to shift or deviate. In this graph, a positive voltage will cause it to deviate to an increased frequency while a negative voltage lowers the frequency.

Fig. 7.



Imagine the input stage of a limiter amplifier as being similar to a funnel. When the input signal reaches a predetermined level, anything higher in amplitude will not pass through the aperture. The input FM signal — between the parallel lines — has spikes of amplitude noise superimposed on the wave. The signal emerging from the funnel neck will have these spikes removed. A weak signal however will fit easily through the funnel and a small amount of the noise is able to sneak through too. This is why low level signals may contain a little noise such as car ignition pulses.

After the noise pulses have been 'clipped' off the signal, there are further stages of high amplification to increase the final usable output. A limiter amplifier is therefore a type of signal processor.

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BASIC ELECTRONICS

PART 26

The twenty sixth in a series

IONOSPHERIC PROPAGATION

Short range two way radio communications uses radiation travelling direct from transmitting antenna to receiving antenna. For contacts at ranges greater than approximately 80 km however it is necessary to rely on a portion of the higher angle radiation being refracted or bent back towards earth. Such refraction takes place in the ionosphere and this month we take a look at how it comes about.

THE IONOSPHERE

The ionosphere is a region of rarefied atmosphere approximately 50 to 400 km above the earth's surface. In this region rarefied gas molecules can become sufficiently ionized by radiation from the sun so as to have an effect on the passage of electromagnetic energy.

The ionization is concentrated in several broad layers, the presence and location of which depends on the level of solar radiation.

Electromagnetic radiation moving through the areas of ionization looses energy and in this way the electromagnetic energy appears to be absorbed by the ionized layers. This absorbtion is greatest at lower frequencies and is proportional to the degree of ionization of each layer. The result is that the most suitable frequency for propagation over a particular path is close to the maximum frequency that will produce a signal over the path.

The various layers are known as the D, E, F1 and F2 layers, as is shown in figure 26-1. The lowest layer, the D layer occurs at an altitude of 50 to 80 km and is often known as the absorbtion layer. This ionized layer is only present while the gas molecules that form it are being radiated upon by the sun. The density of ionization is maximum at midday local time and it is then that the absorbtion is at its maximum.

Depending on the time of year and geography located beneath it, the D layer absorbs electromagnetic energy at frequencies of up to 10 MHz or so. An easily demonstrated example of this effect can be seen on the AM broadcast band (530 to 1600 kHz), where the presence of the D layer during daylight hours limits reception to the ground wave range. With the onset of darkness the D layer disappears and MF broadcast stations can be received up to several thousand kilometres away. The D layer also has a prounced effect on amateur communications on bands of 7 MHz and below, but more on this later.

Also occuring only during daylight hours the next layer of interest is the E layer. Existing at an altitude of approximately 100 km, the E layer is responsible for daytime HF signal propagation over a range of up to 1500 km or so. Irregular masses of intense ionization in this layer are known as sporadic E ionization. Sporadic E is responsible for most long distance 6m band propagation and at times has an effect on 2m transmissions. Sporadic E ionization occurs most often during the summer months, dying away almost completely during the winter.

The F1 layer occurs at an altitude of between 160 to 250 km. Only present during daylight hours this layer is sometimes responsible for HF propagation, however most radiation that penetrates through the E layer also penetrates through the F1 layer.

The F2 layer occurs at an altitude of between 200 to 400 Km. This is the layer primarily responsible for long range — 1500 km plus — HF communications. During the hours of darkness the F2 and F1 layer combine to form a single F layer. The single F layer remains ionized to some degree because the atmosphere is so rarefied at this altitude that the ionized molecules take a very long time to neutralize after the ionizing radiation is removed.

The bending effect of the ionized layers on the passage of electromagnetic waves is similar to the refracting effect of water on light waves. Electormagnetic waves entering an ionized layer have their direction changed to some degree. If the bending or refraction is great enough the wave will strike the surface of the earth at a distant point.

Several abreviated terms are used to describe or preduct the state of the ionosphere. In order to measure the state of the inosphere RF energy over a wide range of spot frequencies is pulsed vertically upwards. The highest frequency at which energy is reflected back to earth is known as the Critical Frequency. The time taken for a signal at the critical frequency to be transmitted upwards and return to the transmitting site is used to calculate the height of that layer of the ionosphere.

Although each layer is of considerable thickness and the refraction that takes place is a progressive action, it is more useful to talk about the particular height at which a pure reflection would cause the same effect. This height is termed the virtual height and is useful in calculating the skip zone.

Skip zone is that area between the range at which the ground wave of a transmission ends, up to the point to which ionospheric waves first return to earth. This effect is shown in figure 26-2. Also shown in figure 26-2 is the skip distance, which is the distance from the transmitting antenna to the point where the ionospheric waves first return to earth.

When communication is required between two distant points the chosen frequency must be sufficiently high to overcome the absorbtion effects and at the same time low enough for refraction to bring the signal to earth at the desired point. The maximum frequency that can be refracted in this way is known as the Maximum Useable Frequency (MUF). For a given communication path the MUF changes throughout a 24 hours period, reaching a maximum at midday between the transmitting and receiving point and reach a minimum at around midnight between the same two points. As the MUF is dependant upon the ionization density in the ionosphere its precise value will vary in accordance with the degree of solar radiation on the ionosphere at the time. Falling to only a few MHz by early morning and rising to exceed 30 MHz in the daytime at times of peak solar activity.

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continued on page 55

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ted to provide for reliable operation without excessive absorbtion. It is equal to 85 percent of the MUF for the particular communication link in use.

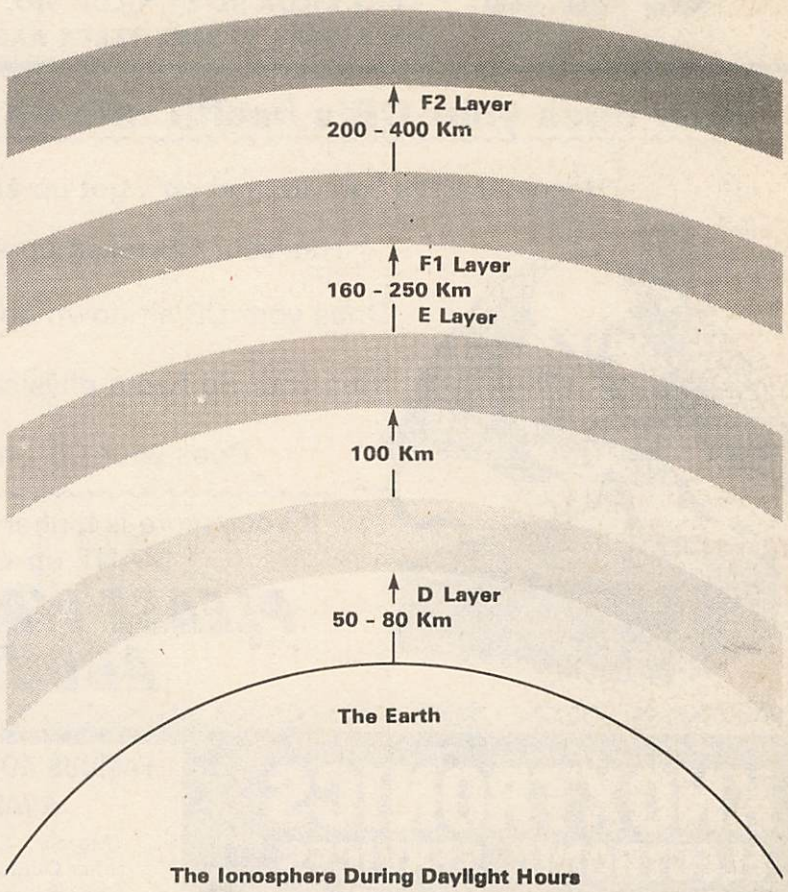
The Lowest Usable Frequency (LUF) or Absorbtion Limiting Frequency (ALF) is the lowest frequency that will produce a workable result over a particular link at any particular time. The LUF is determined by absorbtion in the ionosphere, mainly in the D layer, and by atmosphere noise and static. At times it is possible that the MUF for a communications circuit is lower than the LUF. Although difficult to understand at first, this simply means that for a particular link, say Sydney to London at 1400 hours local time, via the Short Path, (most direct path) the MUF for the F2 layer is down to 4 MHz. At the same time absorbtion in the D layer limits the LUF to 6 MHz. The result is that until the MUF exceeds the LUF no communication can take place on that link.

The critical frequency applies to signals transmitted vertically upwards. Signals on or below the critical frequency transmitted at any angle less than vertical will through refraction be returned to earth. Signals transmitted at an angle close to the horizon will have to pass through effectively wider ionized layers and so may be refracted at a frequency higher than the critical frequency.

The angle of radiation from the transmitting antenna also determines the Skip distance shown in figure 26-2. The lower the angle of radiation the longer the skip distance. Under ideal conditions multiple hop propagation is possible, signals being refracted in the ionosphere and reflected back to the ionosphere from where they strike the earth. In this case more than one skip zone will exist.

The angle of transmission from a simple horizontal or vertical dipole antenna can be determined to some degree by its height above ground and the conductive quality of that ground. Other directional antennas are also effected by these factors to a degree. The optimum angle is somewhere between 5 and 40 degrees, depending on the frequency and path length. The optimum height is betwen 0.5 and 1 wavelength above the ground.

Fig 26 - 1



The Ionosphere During Daylight Hours

IONOSPHERIC ACTIVITY CYCLES

Because the ionosphere is ionized by solar radiation, chiefly ultra-violet radiation, it follows that variations in solar activity will cause variarions in the degree of ionization. Records dating back centuries have been compared with more recent observations of sunpot activity and by comparing with ionospheric propagation characteristics long medium and short term variations in the state of the ionosphere have been related to solar activity. Predictions can also be made as to the probable state of the ionosphere with a fair degree of accuracy.

The cyclic rates of activity are: daily; monthly (27.5 day cycles following the rotational period of the sun); seasonly Zw a high MUF in the summer when solar radiation strikes the ionosphere more directly) and eleven yearly following the eleven yearly peaks in sunspot activity. These have been observed and recorded since 1750, cycle 21 is expected to peak in 1982. Given time it is thought that even longer activity cycles may become apparent.

Forescasts of probable ionospheric activity appear in several forms. Those of particular interests to amateur operators are based on the area of origin — say the east coast of Australia — and either forecast the likely points of reception of each band for days of the month, or give the estimated LUF and MUF to various signal destinations around the earth for times of the day over the period of one calender month; both methods may show both long and short path predictions. Prediction charts for amateur band use should also take into consideration the maximum transmitter power allowed on these bands.

As mentioned before there are two possible signal paths between any two points on the earth's surface. A Great Circle map centred on the point of origin allows these two paths to be easily understood. A great circle map looks similar to other maps at its center but appears grossly distorted around the perimeter it is drawn with the point of origin at the center. The earths surface is then drawn to scale in accord with the bearing and distance from the point of origin. On such a map the most distant point along the circumference is about 21000 km from the point of origin. To move further along any bearing would approach the point of origin from a bearing of 180 degrees opposite to the original bearing.

Along the shortpath bearing to any distant point the distance will be less than 2100 km. At a bearing of 180 degrees opposite to the first bearing the long path distance will be in excess of 2100 km. As an example the short path distance from Sydney to Los Angeles is about 12000 km at a bearing of 242 degrees. The short path signal is normally of greater strength than the long path signal, however at times when the short path is

continued on page 57

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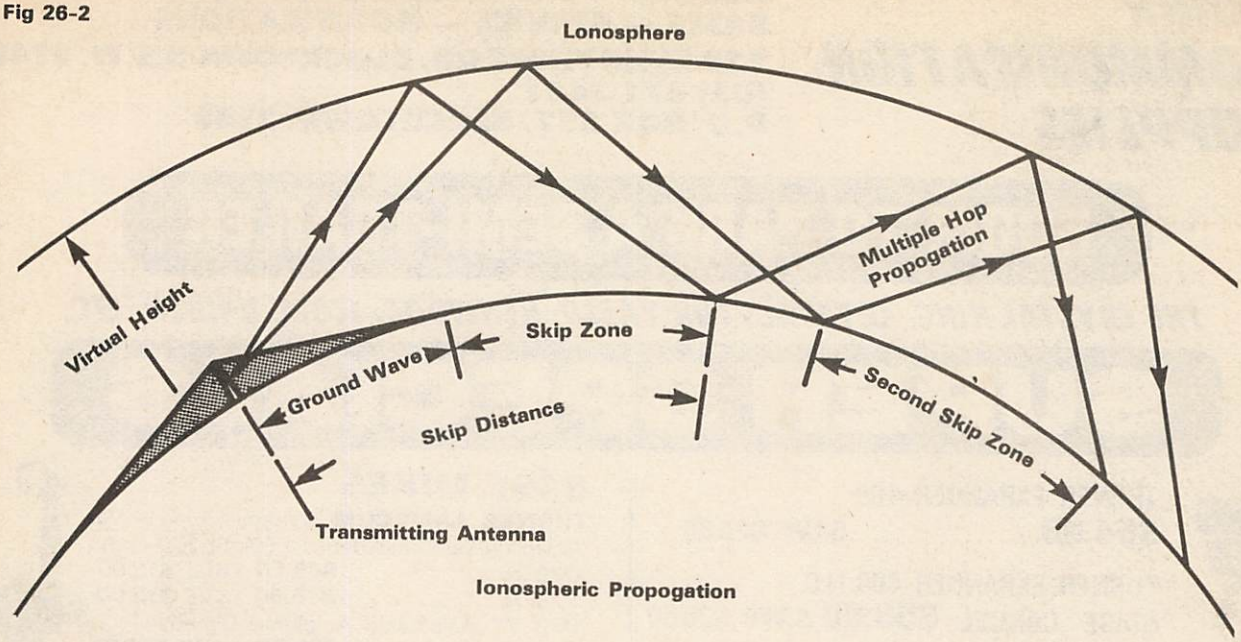
Fig 26-2



closed the long path may be open to satisfactory communications.

In practical communications terms the state of the daily ionospheric cycle suggests the use of certain frequency bands and times for communication with a particular destination. Amateurs are particularly, lucky in this respect as they have bands of frequencies throughout the HF spectrum. Still, the 27 MHz band is capable of world-wide communications when conditions are correct. The reader should now understand the factors affecting such operation. C B A

GLOSSARY OF ELECTRONIC TERMS

AGC *— This stands for Automatic Gain Control, which is a circuit fitted to most modern radio receivers. When a strong signal is received the AGC circuit reduces the receiver's gain or amplificaiton, when the signal fades or a weak station is tuned in the AGC increases the gain. This action keeps the receiver output at a fairly constant level in spite of variations in signal strength.*

AM *— is Amplitude Modulation and is one the earliest methods developed to send voices by radio waves. The strength of the RF signal is varied by the modulating audio signal. In an AM receiver these variations are detected, filtered and the audio signal is recovered.*

BALUN *— This is an abreviation of "balanced-to-unbalanced transformer", which should give some idea of its function. A balun is used to couple a balanced circuit — such as a dipole antenna or piece of 75 ohm "twin lead" — to an unbalanced one. The unbalanced circuit might be a piece of coax cable or an unbalanced load.*

BASE-LOADED ANTENNA *— An antenna with an inductance (coil) or capacitor near its base to cause it to behave as an antenna of a different length. There also exists centre-loaded and top-loaded antennas with the loading component in the appropriate location.*

BEAM *— A beam antenna, one which picks up and radiates signals in some directions better than others. A beam antenna might be compared to a torch, which takes the available radiation (light) and channels it in one direction to increase the effective output.*

BLANKER *— This is a circuit which removes short pulses of signal to prevent them from passing on to following stages. The circuit functions as a noise blanker and is sometimes known by this name.*

CLIPPER *— A circuit which limits the maximum value of a waveform or pulse to a predetermined value not to be confused with a blanker (see above).*

COAX/COAXIAL CABLE *— A type of cable consisting of a centre conductor or conductors insulated from a surrounding conductor. The current flowing in a properly terminated piece of coax is confined to the centre conductor and the inside of the outer conductor. This eliminates unwanted radiation from the cable.*

DELTA TUNE *Also known as a clarifier, this control shifts the receiver frequency to tune in transmitters that are slightly off channel. It has no effect on transmit frequency so keeps your rig in compliance with P & T Regs - provided you're on channel to begin with!*

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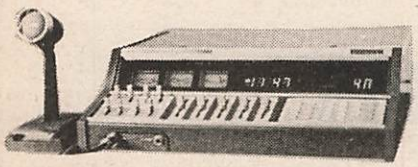

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Bleedover

What is it?

What causes it?

Can it be cured?

This article was written by George McCarthy, our 10.41 Stateside contributor. References to channel numbers relate to the US channel allocation.

MAYBE the "rachet jaw" tying up a channel for a minute after minute is the prime source of irritation to most CBers, but having "bleedover" or "splatter" from a station transmitting on another channel must rank high in the list of gripes for most CBers.

Just when you've finally made a clean contact with another station, along comes that awful splatter that simply wipes out the channel. You wonder where it is coming from and who is causing it. With some luck you may be able to shift to other channels until you track it down — not easy with so many people talking. But suppose you are able to verify that every time he keys his mike on another channel your channel gets clobbered and when he lifts his finger things are clear — what is going on that this should happen?

To the best of your knowledge, your set is in good working order — no one has made any bad comments about how it sounds and it works well on receive — until that darn station begins to transmit. But when he comes on it's "Charlie bar the door" and operation for you is impossible. Sound familiar? You bet it is — one of the prime causes of problems on the CB channels.

Let's take a good, hard look at what is happening and discuss the causes that are involved. Yes, I said CAUSES, for there is more than one reason for the pheonomona known as "bleedover" or "splatter" or "flat topping" or "buck shoting" or whatever else one might call it. In simple terms it means that something is coming out of your speaker that wasn't supposed to be going into the front end of your radio — and wasn't supposed to be on the channel your set is tuned to.

There are three primary causes of such interference; overmodulation of the transmitter, overloading of the receiver, and lack of receiver selectivity. All three may be at work simultaneously making it difficult to determine the cause. Obviously the first, overmodulation, is a problem caused by incorrect operation of the transmitter — the transmitting station's fault. The second two are problems inherent in the way the receiving section of your CB radio works. We should note that these problems are not unique to the CB band, but are encountered on many radio frequencies, the Ham bands and short wave broadcasting frequencies.

Let's tackle the first, and probably the most common, problem — overmodulation. To understand what is happening we must first visualize how the CB band is structured. Then we must get into a little discussion of "linearity" as it applies to both transmitting amplifiers and receiving amplifiers. "Non-linear" operation of transmitting and receiving amplifiers is our major culprit. Once we've got a handle on how those amplifiers work — and what happens they they're over driven — we'll have a real understanding of what's going on — even though we can't cure all of the problems.

Take a look at Fig 1. It represents a portion of the CB band, say channels 5, 6 and 7. Each channel is a tub of water 2/3 full. Because all 23 channels are crammed into only 300 kHz of room, many of them are jammed up against adjacent channels on both sides. This is true for channels 2, 5, 6, 9, 10, 13, 14, 17, 18 and 21. With the exception of Ch 23, the rest are up against one adjacent channel. In order to accommodate all those channels in that space, no channel can be wider than 10 kHz without slopping over on to at least one adjacent channel.

Fine, you say, why not make the channels narrower so that they aren't bumping into each other?

Good idea!

And if we could make all of our automobiles half as wide, we'd have more room on our freeways too. We will show you why those channels must be 10 kHz wide to receive all of the signals on the channel.

But let's get back to Fig 1. That undisturbed water occupying 2/3 of the tub represents the power in an unmodulated carrier. If the water is disturbed so that it makes waves, each wave will have a crest and a trough — representing the audio modulation imposed on the radio carrier when we speak into the mike. We can push audio up to the point where the wave reaches the top of the tub —that's 100% modulation — the point where our audio power has increased our output by 50%. If we try to go beyond that — to go over the 50% increase — the wave gets too high - over the top of the tub. And where does the water go? Right it splashes right into the adjacent tubs (channels) and mixes right in with anything else that is in the tub. The higher the wave is pushed beyond the top (50% increase inpower) the further away the splash will reach. You see that extra power being shoved on to the carrier by someone talking to loud, too close to the mike, or using a "power mike" improperly — it's gotta go somewhere. The carrier can't accept it — 50% is full up — so it ends up in spurious frequencies "buck shoting" up and down adjacent channels frequently covering 75 kHz on either side interfering with half of the channels — and all from one station. Fig 2 represents an overmodulated station on channel 7 — note the effect on other channels.

So, you say, overmodulation is the cause of all of the splatter. For most of it, but the same effect can be caused by an improperly adjusted radio. Let's talk for a minute about amplifiers and how they work.

Any device that takes an input signal and reproduces it exactly, but at a much greater power level, is an amplifier. The "clinker" in that statement is the word "exactly." How many of you have heard someone pushing a P.A. system too hard, or playing rock music beyond the capacity of the radio (or your ears) and have noted the distortion coming

continued on next page

Bleedover

out of the loundspeaker. It's fuzzy, crackling — just not clean.

Every amplifying device has a limit to the amount of power it can push out and still faithfully reproduce the signal that was put into it. This holds just as true for the transistor in the receiving section of your CB radio as it does for the tube or transistor in the transmitting section. Push either one beyond that point and you will generate the darndest bunch of hash and splatter immaginable — and it comes out of your loud-speaker or goes over the air if you're transmitting.

Fig 3 shows a typical operating curve for a transistor or tube. You will note that there is a straight line portion of the curve representing the power output — that's the linear part of operation. We show a sine wave (one audio cycle of one tone) going in and a much bigger one coming out. The difference between input and output is the amplification factor. It can be as little as 50 or 100 for some transmitting tubes and has high as many thousands of times for other tubes and transistors. But the one thing that must be kept in mind is that the output capability should never be exceeded. Notice that the sine wave is the same shape coming out as going in — amplification with no distortion.

Now look at Fig 4. Here we have pushed too big a sine wave into the amplifier. It tries to follow the changes, but at the top there's just nothing more to give, so it has to stop putting out more power at that point. The result? The top of the wave is no longer a gentle curve, but a flat section — showing that the capacity of the amplifier had been exceeded — the sine wave is now "flat topped."

If the "flat topping" just resulted in audio distortion we could endure the lousy sounds involved — gosh knows we've all heard them on the channels. But there is a far more serious side effect of pushing that amplifier out of the linear range into flat topping. That's the splash out of the tub. The process generates harmonics of the frequencies that couldn't be reproduced properly. They are the sum and product of many different frequencies in the sidebands and they splatter up and down the channels. That's the hash we hear and trace back to one station transmitting. He might not even sound too bad — on his own channel — but he's tearing up several channels on eithe rside — and, here is the bad part — HE DOESN'T EVEN KNOW IT!

It takes some knowledge and fairly sophisticated equipment to adjust a transmitter so as to get maximum output without exceeding the limits. Most CBers and Hams don't possess the necessary equipment, so they must depend on the reports they receive from other operators. Some of the radios have devices built in to prevent overmodulation — ALC (automatic level control) circuits, but even they have limits. The best and safest method is the opinion of several other stations that are far enough away so that you are not "over-loading" their receivers.

I have often heard Ham stations replying to complaints of splattering by saying that they are "looking right at their scope and everything looks good." These are the operators who find it difficult to believe that they could be putting out an offending signal. By the time a half dozen stations tell them that they are splattering they might become believers.

We mentioned that faulty connections, bad components, poor voltage regulation — many things can cause an amplifier to operate out of its linear range — but the number one cause by far is excessive audio going into the radio — frequently from an improperly used power microphone.

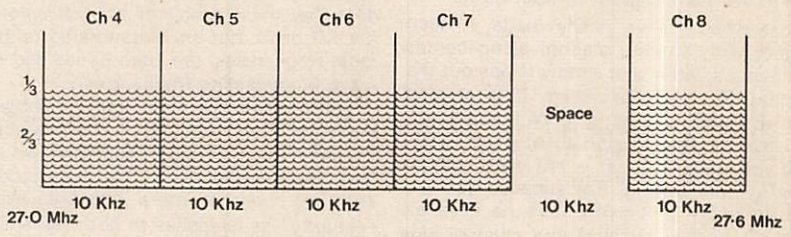
The second cause of "bleedover" lies inside your own radio. The receiving section of your CB radio is a very, very sensitive device. Most of them can produce full volume on your speaker from a radio signal of much less than a millionth of a volt. You'll see the sensitivity listed in almost all specs for CB radios as somethign like "0.5 uV for 10 dB S/N" That figure "0.5 uV" means 0.5 microvolt or half of a millionth of one volt. Many sets are twice as sensitive.

With all of that sensitivity it sure doesn't take much to rumble your loudspeaker. That's fine for digging out those weak signals, but it also means that any other signal that gets into the front end will show up out of the loudspeaker too. The radios have AVC (automatic voltage control) to prevent very strong signals from overwhelming the amplifying transistors in the front end of your radio, but there's a limit to what the AVC can handle. A very strong signal can cause the receiving amplifiers to run off the end of their linear operating portion and then exactly the same kind of hash is generated inside of your radio.

This is known as "front end overload" and it is a direct result of those super-sensitive transistors that make your radio such a great receiver — they get badly over-driven by an exceptionally strong signal — they flat top trying to handle it and the same kind of harmonic hash is created inside the receiver. From the loundspeaker it sounds exactly like the splatter caused by an overmodulated signal.

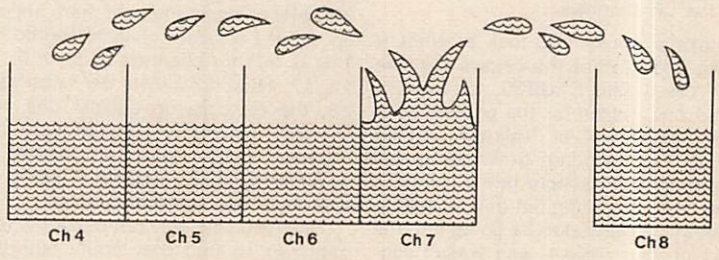
If your set has an RF gain control, you can turn it down and if the splatter disappears it is most likely that a signal was just over-

Fig. 1



The five channels from 4 through 8 are crammed into a space of only 60 khz. The water in each tub represents the carrier power which is two thirds of the total power. The remaining one third will be divided between the upper and lower sidebands under 100% modulation.

Fig. 2.



Showing the effect of overmodulating on channel 7. Not only is the signal distorted badly, but the splatter resulting from "flat topping" covers adjacent channels.

loading your set. If the splatter remains even after cranking the RF gain down quite a bit — then it's more likely that it is caused by an overmodulated transmitter. Without an RF gain control you might have to disconnect the antenna to see if the splatter will go away.

It's important to remember that all transistorized receivers are subject to overload — some more than others. Before you jump on someone and accuse them of overmodulating, you ought to try and determine if the problem is in your own set and the only thing the offending station is guilty of is putting out a very strong signal. Exceptionally strong signals — strong enough to overload your receiver — are usually a result of someone being close to you — either a neighbor or vehicle close by. The problem is obviously aggravated if a station is using a linear amplifier, running from ten to a hundred times the authorized power level.

If the problem is a passing car it will automatically go away. If it's a neighbor, it becomes a problem of negotiation and cooperation — maye you'll have to agree to work channels at opposite ends of the band — or agree to quiet hours for each other.

In a densely packed neighborhood full of CB stations it is a real chore to obtain such co-operation.

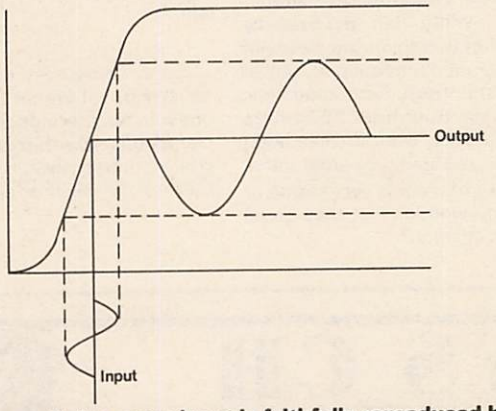
The final item mentioned was "selectivity". We can define selectivity as the ability of a receiver to discriminate between signals — to separate one signal from another that is close by. In modern receivers the selectivity is largely determined by the BAND PASS FILTER in the IF amplifier section. This filter is actually the door to your radio. It has two major characteristics — width and depth. It is easy to visualize the width of the filter — and it is expressed in the number of kilocycles it will allow to pass. For example, a 10 kHz filter will pass frequencies that are either side of the middle by 5 kHz. It is a door just wide enough to let through 10 kHz. Any frequency lying to either side of that slot will be rejected.

The degree to which that rejection will take place is determined by the "depth" of the filter. If the filter has very steep sides (a long passageway) signals just outside of the bandpass frequency will be sharply reduced. The actual reduction is figured in dB (decibels) which is a power ratio figure. If a signal is reduced by 60 dB it has been cut to one millionth of its power and 30 dB to one thousandth of its power. That sounds like a lot of reduction — and it is. But when you're dealing in microvolts at the antenna, a signal that can "pin your meter" will be 60 dB stronger than one that is S-9. If it's just outside the bandpass filter, that's strong enough to overcome the rejection — to force its way through the door — to get into that channel, even though it isn't on the channel frequency.

The closer channels are to each other the harder it is for the filter to separate what should go through from what shouldn't go through. We all feel more comfortable driving on a freeway with a center strip — it provides a margin of safety. We only have six such center strips on the CB band — between 3 and 4, 7 and 8, 11 and 12, 15 and 16, 19 and 20 and 22 and 23. And, except for the last, the center strip is only 10 MHz wide — not very much.

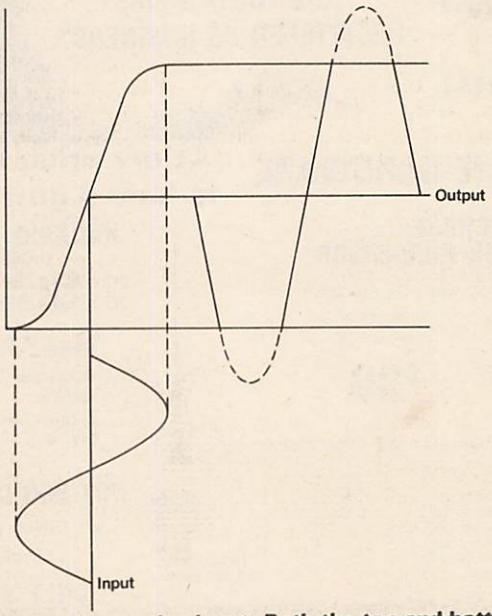
continued on next page

Fig. 3.



Showing how a small sine wave input is faithfully reproduced by a large sine wave output. Notice that the input does not swing past the linear portion of the output curve — shown by the dotted lines.

Fig. 4.



Showing the effect of excessive input. Both the top and bottom of the sine wave output are flattened. Too much input drove the amplifier beyond the linear part of its operation. Flat topping causes extensive interference on both sides of the channel.

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Bleedover

It is possible to make a bandpass filter that is much sharper than 10 kHz — those used for sideband are usually only 3 kHz wide — but the 10 kHz width is needed to accommodate the two sidebands that are on each side of the carrier frequency and to allow for the difference in carrier frequencies transmitted.

The "center slot" of the filter is in the middle. That's the point which should be right on the center of the channel frequency assigned for each channel by the regulating authority. If a station is right on that point it allows for 5 kHz on either side of the sidebands that contain the audio to come through. That's enough room for 5,000 cycles of audio on both the upper and lower sidebands — more than enough to transmit voice intelligence which is largely contained in the frequency range of 200-3000 cycles.

So, you say, if you only need 3 kHz to transmit a voice signal, why not make the filters only 6 kHz wide and leave a nice 4 kHz center strip between each channel?

But sets that have been made under FCC type accepted or type approved specifications are only required to meet the channel frequency specification by a tolerance of 0.005%. Holy smoke! you say, that's five thousands of a percnt — isn't that close enough? It sounds great — until you realize that you are dealing with a frequency range of 27 million cycles. Apply 0.005% to that figure and you find that the carrier frequency can vary as much as 1.36 kHz at channel 23 or 1.348 at channel 1. Now, that's a variation from that center slot and it can be either lower or higher than the centre frequency. This means that two stations can be operating within FCC specs and still be as much as 2.7 kHz apart from each other.

Keep in mind that FCC regulations require that the sidebands be limited to only 4 kHz on each side for AM operation and to 4 kHz for sideband. An AM station properly modulated can take up a width of 8 kHz. Examine a "worst case" situation involving two AM stations that are properly modulated, but at the extremes of the frequency tolerance. Both are 8 kHz wide. Both have 350 cycles of their sideband leaking over into the adjacent channel Both are legally operated transmitters. If either one of them is very strong or very close, is it any wonder that they bleed over onto the next channel?

You should realize, however, that if the filter were to be made any narrower your radio might not even receive one of the stations. So, we have a situation that works against discrimination against unwanted signals — and it isn't the radio manufacturer's fault. There is no doubt that some sets have filters that are "deeper" than others and thus do a better job of keeping the garbage out. Unfortunately, there seems to be no standard terminology to describe the selectivity characteristics of the CB radios currently on the market.

A review of 15 different sets showed that it was impossible to guess the shape of the filter from the information given. Your best bet as a potential buyer is to listen to several sets before you buy — preferably under crowded conditions — and pick the radio that seem to give the best discrimination against out-of-channel signals. An RF gain control is a decided "plus" in helping with the problem.

So, we have seen that "bleedover" can be caused by a number of factors — the major ones being overmodulation of a transmitter, overloading of a receiver and lack of selectivity in the receiver. Often all three will be present in severe cases of interference.

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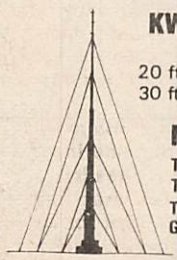

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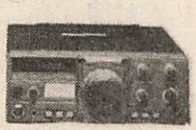

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SYDNEY SCENE

by Paul Richards

SINCE the start of the new Sydney Scene I have had several letters complaining of harrassment and oppression of the CBer. These have varied from Government and ham operators to the general public and other CBers as the culprits. No doubt there have been some unfair practices in the past, but to keep raking up this sort of muck is not, in my estimation, of much value.

If the CBer could be made a martyr in the eyes of the public then perhaps it might be all worth while. Even the copy of "The Statutory declaration" from one John Tate, which I received in the mail recently is not enough to accomplish the martyr image.

The declaration alleges a story that John was the pirate operator in Darwin who provided the only outside link for many hours after the 1974 Cyclone Tracy disaster. He broadcast messages to both private parties and government agencies through pirate friends in Canberra and other places. The story continues that after all their good work they got busted, lost their sets, fines of $500 and put on 3 years good behavior bands. (That is an oversimplification of the story related to me – but fairly accurate in text).

This is certainly an unfortunate experience and I'm sure all would agree, quite unfair under the circumstances.

BUT, lets look at reality for a minute and try to relate it to our future.

Governmental attitude in toward CB is conservative. They have trouble enough trying to control a free press and the idea of private citizens being able to communicate anywhere in the world frightens them. Yes, we have ISD and you can make overseas phone calls, but this service could be withdrawn by Telecom Authorities without notice should the occasion arise. NOT SO with private radio. Even if you pull the main power switch, CBers can still get out on battery power.

Now the Ham operator's attitude. He has some technical knowledge, has studied, worked hard and passed exams; so why the hell should everyone else in the country be allowed to buy a set and go on air? Especially if he has no training or knowledge of the technical side or experience. Do not forget that 27 megs was a part of his domain before it was given to the masses.

Then, add to the above a percentage of bad-budgies. We all know they are about! Considering past history and grudges it doesn't look good – does it?

Seriously, I suggest that we stop raking up the past, struggle with the present and work for something better in the future. The Government could make a big blunder in 1982. If they take 27 megs away from CB they should well imagine the consequences. There should be no doubt in their minds – much less ours – that the hundreds of thousands of 27 meg sets in the country are not all going to wind up in the garbage bin. No one could be that silly!

What stands out most is that they have no need to reclaim that band. It is about the most useless area of the spectrum. Only some obscure reason, not even known to the Minister, could be involved in taking it away. Perhaps the skip is worrying them.

If the Government could join us in forgetting the past mistakes, both theirs and ours. then all of us could parsue a little logic and understanding; instead of prejudice and petty hates. We could work together for a clean brilliant future for CB in Australia.

It is, in my estimation, up to 'Big Brother' to make the first move. They must get together with the CBer, consider his needs, apply their own basic requirements, then produce some enforceable laws with teeth to govern the frequencies. The guide lines name RBs sound like they were written by RBs (Rat Bags that is). They can't even enforce them to prosecute an offender of the worst kind.

The RIs I've met are damned nice blokes trying to do a job without the tools to complement their responsibilities.

With the coming rallies and conferences, lets hope that we, the CBers can keep cool heads and act with logic and common sense to prove that we are not all a pack of idiots. In this manner we can earn some respect and dispell the present loutish appearance we have been shackled with to date.

★ ★ ★

I am pleased to report that the Sydney UHF social group known as "Communications Assistance Group" has decided to formalize into an organized body with a concerted view to the future of CB. A very lofty new name has emerged – they will now be known as "NETWORK OF INDEPENDENT RADIO OPERATORS (Australia). (N.I.R.O.). They hasten to point out the word independent does not imply any desired immunity from the laws or governing bodies, but only an independence from other organisations. It is envisaged that committees will be set up to liaise with NCRA and P&T on requirements for the future of CB operators. Although NIRO is mainly a UHF group, they realize the necessity of maintaining the 27MHz band, if for no other reason than peace of mind.

Organisers have been appointed with Peter Atkins (VBQ906) as spearhead. Peter, a former Sydney-sider has been living in Melbourne for some years and just returned to "God's Country". He has had some experience in organising in the deep south.

NIRO hopes that branches will spring up in other areas of the country and organisers point out it's not just another club, society, or association. It is a loose-knit group of dedicated people looking for enough members to have a voice able to be heard and respected.

With the enthusiasm of this group, I'm sure they won't "fiddle while Rome burns."

The Sydney Scene has just found what must be the most avid CBer in Australia. I will relate his story in the next issue. A real heartwarming story of strength and courage. Anyone wishing to contact 'The Sydney Scene, please write to:

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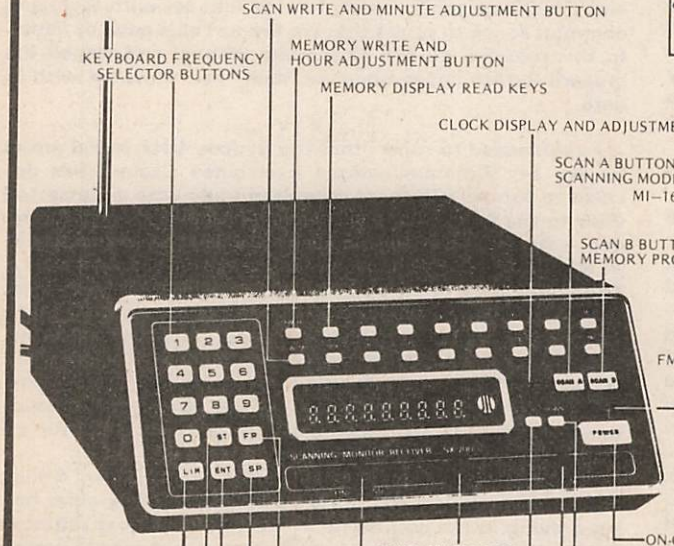
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CLUB NEWS

Club News will be accepted from any CB clubs and will be printed as space allows. However, all copy must be type-written and double-spaced. Send items to Club News. CB ACTION, Box 628E, GPO, Melbourne, Vic. 3001.

C.R.O.W INTERNATIONAL INC.

C.R.O.W. was conceived by the "Ghost of Henry Morgan" after considering some of the ridiculous archaic, parochial attitudes of Postal & Telecommunication Radio Inspectors, gripey old hams and 'toffee apple' CBers.

The initials C.R.O.W. originally represented "Clandestine Radio Operator of the West" as the first series of transmissions emanated from Western Australia. The word "clandestine" seems to have that magic added effect to put C.R.O.W. in alignment with the much outdated 1905 Wireless & Telegraphy Act.

Now, as C.R.O.W. also refers to a predatory black, wily and cunning bird which is easily identified by its raucous 'cawing' call, C.R.O.W. decided that this should be the selective tone signalling, viz: "aark aark aark!" to herald CROW's presence on the frequency.

These distinctive sounds were soon heard much further afield and CROW began to gain stature and recognition on a global scale.

This led to a major re-think in CROW's planning department and on the very same day the new company emerged, viz: "CROW International Incorporated". The letter 'O' was then changed to represent "organisation". (Clandestine Radio Organisation of the World).

Headquarters itself would remain in Western Australia and regional managers would be appointed in all recognised ITU zones to recruit members and be responsible to "CROW-01" for world-wide spectrum operations.

Because of the prowess that goes with being a member of the European Economic Community, "CROW-01" is at present negotiating in The Hague to register "SOCIETE de CROWE INTERNATIONALE" which will operate from ★ Bordellaux in France to control the Western Sector.

(★ Not to be confused with any of the Bordellos in Italia by the way).

This is an invitation to all "hobby radio" operators who feel bored and cheesed-off with the status quo to become part of a major universal power group whose aims and objectives are too great to mention in this article.

Reply in the first instance to:-

CROW International
Incorporated — 01
P.O. Box 225
Armadale W.A. 6112

Kaarrkk!
President

GUMBOOT QSL CONTROL, NZ

The Gumboot QSL Control was formed in April 1979 for New Zealand QSL card collectors who wished to QSL to other parts of the world. One small advertisement in the Shop 'n Swap section of this magazine brought in no less than 200 replies from Australia alone. Many of these went on to join the club, and regularly correspond and swap their personalised cards, via the club, with newer members.

Although primarily a QSL-swapping club, we now offer a club stamp, ID card, tourist information, roster and many of the other items that the majority of QSL clubs offer these days. The cost of joining (March 1980) is 20 personalised cards plus $3.00 Australian. For this, the collector received 20 other members cards, usually from some other part of the QSL-ing world than the collector's, ID card, certificate, unit number, applications to other clubs that we know are not a "Fly-by night rip-off" (as sadly some seem to be), and some of our own applications to hand on. The club rubber stamp, a NZ patch and the roster cost $7 for the lot.

Even if you do not wish to join the club, please feel free to drop a line and a few cards, and we will QSL back, and hand extras on via the club.

TRACE WARD
President, Gumboot QSL Control
P.O. Box 4127, NEW PLYMOUTH
New Zealand

WILD GEESE INTERNATIONAL

(Veterans CB Radio Group)

We wish to inform readers worldwide of the formation of a new club called Wild Geese International (Veterans CB Radio Group) with headquarters in Perth, Western Australia.

Our aim is to bring together, from all countries and all walks of life, CBers who all have one thing in common, and that is combat experience. We have been down that road before, do not wish anybody else to have to do it and we therefore strive for peace and harmony on the airways.

Our initial membership stands at 15, and includes English, Australian, American and German, who have served in the Royal Marines, Army, Navy, Comandos, Paratroops, Submarines and French Foreign Legion — from the Russian Front, around the world to French Indo China and Vietnam.

We meet on Channel 12 LSL at 8 pm Wednesdays and pick a channel for a Mess Meeting to which we welcome independent stations to our QSO.

Membership is open to any serving or ex-combat veteran of any country regardless of nationality, race, creed or religion. Enlistment forms are available from Wild Geese International, PO Box 73, Como, Western Australia 6152.

Members will receive six issues of Standing Orders (Newsletter) per year. Applications will only be accepted from licensed operators, and the Wild Geese call sign, when issued, must not be used on illegal channels. Any member operating illegally when using his WG number is liable to Court Martial and dismissal from the group.

Finally we would like to congratulate your magazine for its fine articles, and its unbiased views, keep it up. We have enclosed a copy of our first issue of our Standing Orders for your perusal, hope you like it.

Thank you for publishing this letter.

Wild Geese 1
(WAS 039)

IPSWICH Q'LD CB RADIO SOCIAL CLUB

On behalf of the 4IQ (Ipswich Queensland) CB Radio Social Club I am writing to you in the hope you will publish this letter in your magazine.

As the name suggests we are principally a social club organising social activities for our members. We have now got our own club house situated at Carole Park and we have pool and games nights with other CB clubs in and around Brisbane and of course new members are always most welcome.

A general meeting is held at the hall on the second Wednesday of each month and we cordially invite other CB clubs or any interested people to attend and join in the discussion. Besides the weekly QSO on U18 at 7.30 pm on Tuesday, we endeavour to have at least one good outing per month whether it be a car rally, Bar-B-Q or sporting match with other organisations.

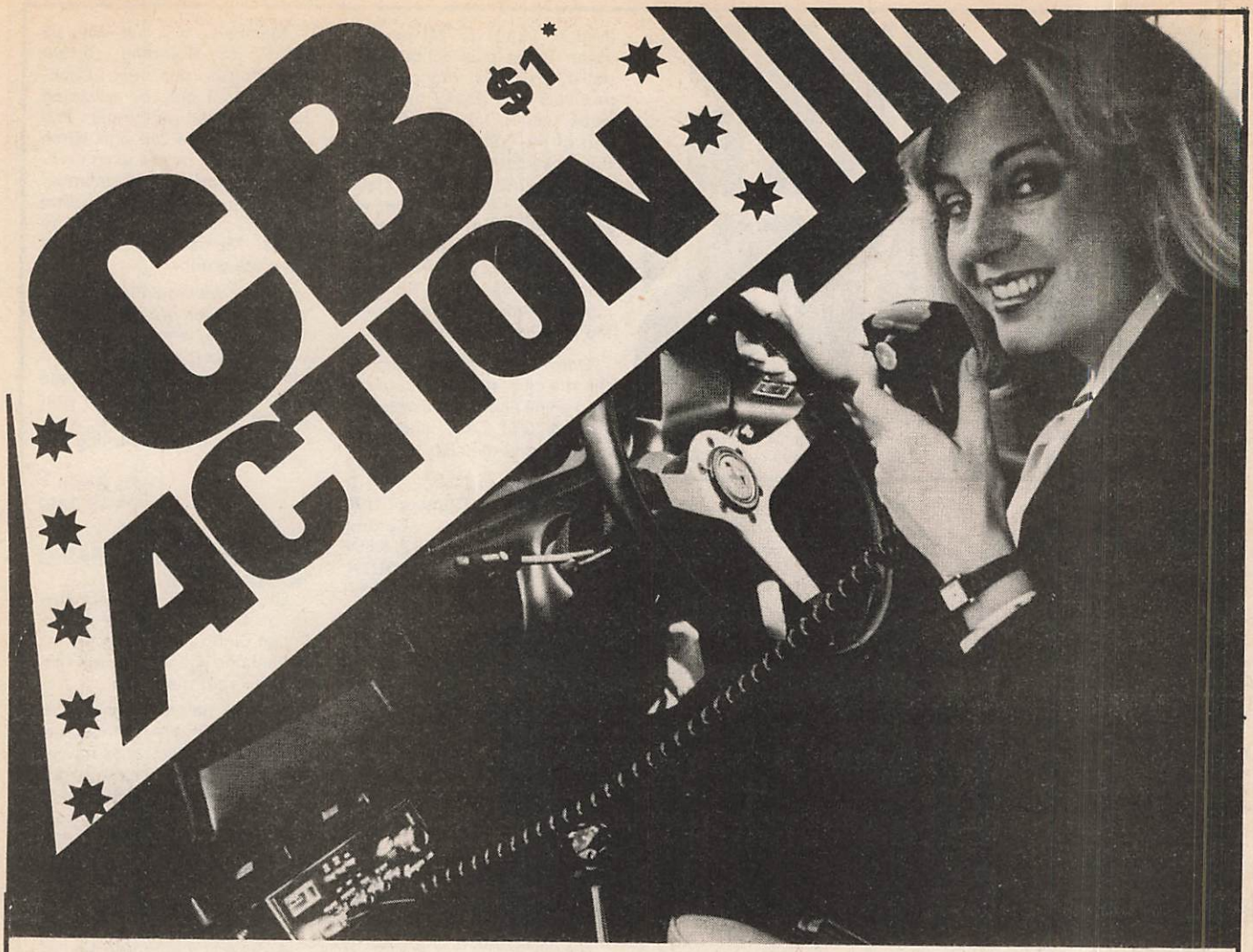
Membership is expanding all the time and we feel that the club has a lot to offer intending members. QSL cards, T-Shirts and bumper stickers are available at reasonable prices.

We now have members in other states and we would like to invite CBers from all over Australia to make application for membership.

All enquiries should be made to the Secretary, 4IQ (Ipswich Qld) CB Radio Social Club, P.O. Box 56, Booval, 4304.

JIM WRIGHT
Assist. Secretary

C B A



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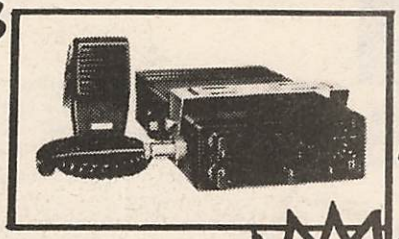

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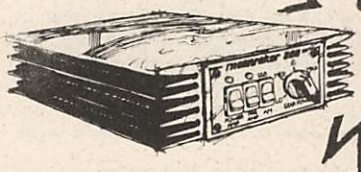

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National Citizens Radio Association of Australia.

NCRA NEWS

The National Council meeting has come and gone, and there has been an extensive change inthe National Executive. The new National Executive is as follows:
NATIONAL DIRECTOR Terry Watkin
DEPUTY NATIONAL DIRECTOR Col Ford
NATIONAL SECRETARY Terry Watkin
NATIONAL TREASURER Harry Fallon
NATIONAL LIAISON OFFICER Mrs Jan Christensen.

There are a couple of points there which need explanation, the first of which is why I hold the positions of both Director and Secretary.

It was the aim of the Council to re-shape the structure of the NCRA, and this was the first step. Originally it was intended that I take on all Executive positions in a caretaker capacity until the Annual General Meeting in November. However after much discussion it was resolved that this would not be in the best interest of the Association at this time because of the workload involved, so a compromise was arrived at in the merging of the positions of Director and Secretary.

To save on costs, if for no other reason, the major part of the Executive now resides in Queensland. Col Ford is the only exception, as he lives in the ACT. When the time comes for us to hold an Executive meeting in a couple of months time, the only expense will be in bringing Col to Brisbane. This of course will save the NCRA quite a bit of money which can be channeled into other areas.

The National Council left vacant the position of National Liaison Officer on the understanding that when I returned to Brisbane I was to offer it once again to Jan Christensen, the previous Liaison Officer who had to resign because of ill health. Jan is feeling much better these days, and so has taken it back on again.

Both the previous National Director and the previous National Treasurer (Peter Cramer and Chris Webb) resigned at the Council meeting for personal reasons. On behalf of the NCRA as a whole I would like to take this opportunity to thank them both for the work which they have put into the Association and to wish them well for the future.

★ ★ ★

A reminder to the States that nominations are now open for the 1980 CB Merit Award. The monimee need not be a member of the NCRA. The only qualification is that he/she has made an outstanding contribution to the betterment of the CBRS in the past year.

You will remember that the initial Award for 1979 went to Mike Hurst-Meyers. In fact Mike was the only nomination. (By that I mean that his nomination was unanimous).

So get those thinking caps on and send in your nominations.

★ ★ ★

In the next issue I will be giving you a detailed run down of the last National Council meeting. Unfortunately, to date I have been unable to find the time to write up the Minutes, but that will be done in the next week or so.

★ ★ ★

Just for a moment let's take a trip back through time to 1978. To be specific, we'll go back to the time of CB ACTION Number 10. On pages 60 and 61 we find Sydney Scene which back in those days was being written by Allen Gray.

The subject of the column that month was an invention which "prevents TVI". What it is in fact is a jamming device. It works on the principle that, if a person is having TVI problems, he just goes out and buys one of these devices (for $35) and plants it as near as possible to the offending CB operator, turns it on, and all is well. That is the sales pitch, anyway. We of course, know that all will NOT be well. Any type of jamming will undoubtably lead to violent reactions from CBers.

Well it has appeared again. I have written to both the Minister and the retailer of the device on the matter. As soon as an aswer is received I will include it in the following issue of CBA. I am sending copies of the material which came into my hands to CB ACTION. I am sure that they will be interested in following it up.

The issue was brought to my attention by Mr E. (Ted) Lyons, Secretary of the Mount Coot-tha CB Club here in Brisbane, and for this I thank him.

The following advertisement appeared in the 'Telegraph', one of the major papers in Brisbane.
"STOP TV INTERFERENCE. Irresponsible CB Radio operators can cause interference. Stop this with our BUZZ-BLOKER. For literature write: James Kennedy & Co., P.O. Box 142, Broadbeach 4217 (075) 38 4213."

Ted wrote for the literature.

A personal letter from James Kennedy accompanied the reply. It read:
"Dear Sir,

Sorry to have delayed in replying to your request, but as I was out of town on business last week, I missed your letter.

Please find enclosed an illustrated phamplet on the "Buzz Blocker" which is complete with batteries lasting approx. 3 months and should be positioned as near as possible to your offending CB operators. You simply hang the Blocker on a fence or in a bush at the nearest point to the CB. As the unit is water proof, no harm will occur due to rain etc. No repair man is needed, as the unit is complete when received, and only requires hanging up, with the aerial hanging vertical.

Yours sincerely
James Kennedy." (signed)

I won't bore you with all the technical parts of the instruction sheet which was sent to Ted. Instead I will just quote the parts which concern us:

"PREVENT C.B. RADIO INTERFERENCE
Dear

Thank you for your inquiry regarding our "Buzz-Blokker". The reason for our developing the "Buzz-Blokker" was to make it possible for a person who is having interference problems to send out a signal to indicate to an unknown user of citizens band (CB) radio equipment that his equipment is causing interference with the reception and use of other electronic devices in his immediate vicinity. By sending out a continuous hetrodyning tone over the radio frequency spectrum from 26.965 to 27.235 megahertz, it warns neighboring CBers (in a radius of around 100 metres) that the person who is operating the "Buzz-Blokker" is suffering from Radio Frequency and/or Television Interference caused by the CB radio set. Under RB14 of the Wireless and Telegraphy Act, any CB operator who is informed that he is causing interference to radio and/or television reception must cease transmission inmmediately.

The "Buzz Blokker" can thus be used as a non-verbal way of reminding the CBer of his responsibilities under the Act.

The Minister for Post and Telecommunications, Mr A. A. Staley, has defined the "Buzz-Blokker" as being a non-message sending device and under the current Wireless and Telegraphy Act, no licence is required for its operation.

If you wish to purchase a "Buzz-Blokker" please send a cheque for $35 to the above address and one will be forwarded to you as soon as possible. Please allow 14 days for delivery. Battery and postage included in the above cost."

The distributors for this device are listed as:
QLD . . . Read Enterprises, P.O. Box 142, Broadbeach 4217.
NSW & VIC . . . JAMCO, P.O. Box 123, Alawah, NSW 2218.

It apparently works on around 5 milliwatts.

All in all not a very nice situation, is it?

★ ★ ★

The new National Treasurer, Harry Fallon, has been hard at work trying to sort out finances. In accordance with the new National Executive's realisation that we must live within our means, he has released the 1980 budget. The previous budget was for around $7500, but, with the Executive travel reduced as I mentioned before, and the subsequent almost complete reduction or elimination on the need for telephone calls interstate, the following is the revised budget:

Travel . . . (to National Council Meetings).	$250.00
Accommodation (at Brassey House)	$150.00
Hire of halls (Brassey House Conference Room)	$180.00
Secretarial Expenses	$150.00
Printing and stationary	$200.00
Miscellaneous	$200.00
Total	$1130.00

The above has also made allowances for increases in fuel, etc (micellaneous). So, as you can see, we are really trying to do our bit in reducing expenses. We are determined to make the NCRA financially viable again as soon as possible.

★ ★ ★

It seems as though the 27 MHz band isn't the only part of the CBRS which is having troubles. Once again I am going to lay bare the correspondence files of the NCRA so that you can gain an insight into what we are trying to do. I believe that in this way I can show you that we don't just sit around doing nothing, pretending that we're doing something.

The UHF problem of conflict between private and commercial users is centred mainly around the Gippsland area of Victoria . . . for the moment anyway. The other States are having problems with commercial enterprises using UHF, but as far as I know there has been nothing on the same scale as Victoria is experiencing.

The following letter was sent to me by Mrs Barics of Traralgon East, Victoria. It is a copy of a letter sent to her by the State Electricity Commission of Victoria in reply to one she had sent earlier. The words enclosed in brackets at the end of most of the paragraphs are Mrs Barics comments to the contents. The letter is dated February 22nd, 1980.

Dear Mrs Barics,

I refer to your letter of 8 February, 1980 concerning the use by the Commission of UHF Citizens Band Radio. The Commission has a number of VHF radio systems for operational purposes. However the present VHF operational system in the four districts in Gippsland situated at Warragul, Moe, Morwell and Traralgon becomes overloaded during certain times and these particular districts are unable to use it for local operational purposes. (VHF rarely used. We've listened). The Commission has applied to the Regulatory and Licensing Section, Postal and Telecommunications Department, to obtain additional frequencies in the VHF band, but at present, frequencies in the VHF band are unavailable because of the crowding of the spectrum. (Rubbish).

Condition RB14 and Guidelines RB14A for the licensing and operation of the Citizens Band Radio Service provides that Citizens Band radios can be used by any person in the community for personal communication, whether it be for recreation or domestic purposes or in connection with work or business, provided such use complies with the operating rules. The Commission is therefore entitled under the Regulations to use the Citizens Band Radio Service for its business purposes. (Cutting peoples power off, names and addresses, also where the keys are left for the man to get in.)

In order to ensure that the Commission maintained an effective customer service in the area, it introduced UHF Citizens Band units, comprising a base station and four mobiles for all of the four districts. These Citizens Band units are very cheap compared to our normal VHF units and are providing an interim facility which cannot presently be provided by other means.

Separate licences are held for each of the districts and although they all have the same call sign, each identifies the base station concerned. (What happened to 5 on the one call? SEC has 30 sets that we know of).

Prior to the Commission introducing Citizens Band radios, all 40 channels were monitored and challel 29 appeared to be relatively little used and thus favourable for the Commission's local operational purposes.

The Commission is well aware of the regulations regarding the use of call signs, the duration of transmisison and the sharing of the channels by all Citizens Band users.

The Commission has not set aside channel 29 for its private or exclusive use nor is it in any way in breach of the RB14 of the licencing and operating of the Citizens Band Radio Service. (They tried but it didn't work).

Since receiving your letter on this matter arrangements have been made to use channel 20, instead of channel 29. The Commission's policy is, in accordance with the regulations, to share time equitably, to minimise the impact on other legitimate users and this policy has been re-emphasised to personnel. (They use both and cleaners use 39).

As a consequence of your letter, it has been established that on occassions personnel have transmitted confidential information over the system. Such practice is contrary to Commission policy and you can be assured that personnel concerned have been reminded of the importance of confidentality in the strongest terms. (Still doing it).

The Commission believes that its personnel have not been involved in the use of foul language on air. It appears that Commission personnel could have been mistakenly thought involved, as there have been a number of instances of cutting in where foul language has been used by someone not using a call sign. (Didn't have that problem till they started using it).

If you have any further enquiries concerning this matter please do not hesitate to contact the Manager of our Gippsland Electricity Supply Region, Mr H. Trevenen, who is responsible for the operational aspects of the Citizens Band radios used in that Region.

Yours sincerely
(signed)
G. A. McIntyre
Secretary."

I received the above, plus a covering letter from Mrs Barics on the 14th March. I was tempted to write direct to the Victorian SEC, but after thinking about it and reading the RB14 time and time again trying to find a technicality we could use to stop this practice (and finding none) I gave that idea away and decided to write again to the Minister. The letter was sent the same day. It read:

"Dear Mr. Staley,

Please find enclosed a copy of a letter from the SEC of Victoria. The matters contained in this letter were brought to the Association's attention by Mrs Barics herself. The NCRA is greatly disturbed by the Minister's attitude to the use of the UHF CBRS frequencies by an organisation as large as the SEC. The NCRA would like to put the following questions to the Minister for his urgent attention.

1. Is it indeed true that there is insufficient VHF space for the SEC to be granted separate additional frequencies? I must admit that the NCRA finds this rather hard to believe.
2. In previous letters (to date unanswered) the NCRA made a submission to the Minister for the allocation of a 40 channel General Business Radio Service at least one MHz away from the current CBRS but within easy conversion range of the FM 320. Surely the Minister can see the soundness of this proposal when the current SEC position is brought to light. The NCRA again asks that the Minister looks seriously at this proposal.
3. Apparently SEC staff are passing confidential information across on the UHF frequencies. Although the SEC denies that this is still going on, you will see by the notations in the letter made by Mrs Barics that it is indeed still the practice. The NCRA cannot protest strongly enough to the Minister about this state of affairs. Will the Minister take action on this?
4. How many other State bodies such as the SEC have applied for use of the UHF band in the CBRS? Does the Minister plan to allow such use to become the norm rather than the exception?
5. How can the Minister seriously expect CB operators to go to UHF when they have to compete for channel space with business concerns? Perhaps the Department is making 'sweetheart' agreements with the State bodies by offering them the use of the CBRS with its cheaper equipment and licence fees.

In summary, if the Minister honestly wants CB operators to make use of the UHF channels, he must find some way of preventing this blatant bastardisation of the wording of RB14. CB operators are willing to accept small businesses on the band for short terms while they await VHF allocation. However there is nothing small nor short term about the SEC setting up 4 bases with 16 mobiles. In a few short words . . . "Something smells in the State of Victoria." Awaiting your reply.

Terry Watkin,
National Director, NCRA."

If any person reading this column has proof of extensive use of the UHF CBRS by commercial interests, please send all the information you have to me at the earliest possible moment. We must try to stop this sort of thing before it becomes too widespread.

★ ★ ★

On the subject of submission . . . Mike Hurst-Meyers and Col Ford are at this time going about the unenviable task of drawing up the 1980 NCRA submissions for changes to the RB 14. Frank Gaensler of NSW is also working on the UHF submissions.

Well, that seems to be it for this month. Don't forget, if you have any enquiries, write to your local State Division, or to the National Executive at P.O. Box 406, Fortitude Valley, Queensland, 4006.

Terry Watkin,
National Director, NCRA

C B A

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CB ACTION RIG TESTS & RIG REVIEWS INDEX

RIG TESTS —

18 channel AM/SSB mobile unless otherwise stated

	Issue
Apollo MH-1 (no tech specs)	7
Apollo MH-1V base	17
AWA Teleradio SSB 5 18	35
ARF-2001 base	37
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CP 180	18
CP 2000B base	27
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Hornet	10
Hustler UCP 1854	9
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Johnson Viking 4740-18 (no tech specs)	7
Johnson Viking 4740-18 (re-visited)	13
Johnson Viking 4740-18 (updated)	24
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Liner S-878P	17
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Midland 79A-892	14
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Philips SSB/AM 201	12
President Adams	16
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SBE's microprocessor rigs-Console V1 base & Sidebander V1	29
Scorpion base	21
Sound Four SB-18	9
Super Panther	13
Sawtron 880 UHF 40 channels	31
Signet Telstar 1	30
SS.120 40 channels	36
Tasc TM 1100 23 channel AM only	4
Tasc TM3100	12
Tram D-201 23 channel base	6
Tram D62	23
Tram D64	25
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Xtal Centurion 23 channel base	5
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RIG REVIEWS —

18 channel AM only mobile unless otherwise stated

	Issue
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Alpha International 23 channel	6
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Contact PSC-201	10
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Electrophone CB 530	7
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HMV Roadhound TX-55	7
Hustler UCP 1018	10
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Realistic Tele-fone 18	18
Realistic TRC-424C	15
Royce 1-614 23 channel	8
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Sawtron 771-modified	10
Signet Seeker 1	24
Tomcat 23 channel	6
Thorn 1502	9
Wasp	12
Wattmaster XL-18	25

Photocopies of rig tests and rig reviews are available for $1.00 each from CB ACTION. Where a more comprehensive review is available from the CB RIG REVIEWS magazine (produced by the staff of CB ACTION), this can be specified and will be supplied. Photcopies will only be sent after receipt of the remittance.

Address all correspondence to: CB ACTION PHOTOCOPIES, Box 628E GPO, Melbourne, Victoria 3001 Australia. Please do not send cash in the mail, use cheque, postal note or money order.

SHOP N' SWAP

WANTED good AM rig, hardware, licence, helical, power supply, coax. Reply Unit 44, 19 Tyne St, Burwood 3125 Burwood.

FOR SALE Redco Digi-Scan UFO suits most PLL rigs $100 ONO excellent condition. Phone about 6 pm (03) 598 3015 David, Melbourne.

SWAP solid stage Liner (not working) for Leson TW232 and $40 or $80 cash. Phone (03) 465 1829 after 5 pm, Thomastown.

QSL collectors 100% return. Will swap one for one. Send to Mark (GW23) 51 Railway Place, Williamstown 3016 Victoria, Australia.

WANTED plans and circuit diagrams to complete modifications of Kemtronics 1000. Will gladly pay. Phone Rod at Broken Hill (08) 5 872.

WAGNER base fitted with Digi-Scan 26.335 to 28.805, 5/8 SWR meter and coax. Lot $150. Write Rod, 28 Lex Gr, Oak Park, Melb. 3046.

FOR SALE half wave aluminium dipole, great for working DX. Phone Geoff after 4 pm on (03) 379 6972 Melbourne.

WANTED AWA Teleradio SSB618D. Good condition. Write Julie, Southern Coast Radio 47, PO Box 3 Ocean Grove, Vic 3226.

WANTED damaged AM or SSB sets for parts. Will pay in NZ cash. Contact SN 19, Peter PO Box 30832 Lower Hutt, New Zealand.

ATTENTION membership now available for Hotel Kilo QSL swap club. SAE for details 1-4-1. Ian, 8 Princess St, Macksville 2447 NSW.

FOR SALE Midland telephone type AM one month old $100 ONO excellent condition. Phone (02) 949 3794 after 6 pm, Blue Dolphin, NDD 363.

COMMUNICATIONS RECEIVER DX160 0.15 to 30 MHz BFO for SSB excellent condition. Phone Darryl (02) 523 9446 $120.

QSL SWAP we QSL 100%. Swap 1-4-1 to Lakeside 840 David Hocking, 2 Babilla St, Fairview Park SA.

FOR SALE Realistic TRC 469 with ½ wave Ringo. Excellent condition, top mobile rig hardly used $100. Phone Mick (02) 759 2057 Sydney NSW.

DEVIL'S QSL CLUB has world wide membership. Join the ranks of the worlds top collectors. Send SAE Box 532 Salisbury South Australia 5108.

GUMBOOT QSL Control PO Box 4127 New Plymouth New Zealand. $3 and 20 personalised for 20 different and membership.

FOR SALE Karinna KSB 18 ch AM/SSB, mobile whip, 12 mths old, as new $130 ONO. (055) 72 1746, 12 Foster St, Hamilton Vic 3300.

WANTED WANTED schematic, handbook Expo/Pace 23 channel crystal mixer S-2V model. Williamson, 6 Cuthbert St Albany Creek 4035, Brisbane.

QSL SAVER send yours, send mine. 27 Jayne, 23 Thomas St Cavan 5094 SA. Please QSL 1-4-1, cheers.

AVANTI Astroplane 5/8 4.5 dB $40 ONO. Gemtronics 23 ch $55 ONO. Both as new condition. Phone (03) 337 4408 Melb.

SWAP QSL CARDS Send five of yours for five overseas cards. Enclose 3 Postage Stamps to cover Postage & Packing to Daryl, P.O. Box 532 Salisbury 5108.

PANTHER Power two amp power supply $35 ONO brand new. Contact Paul on (049) 55 8008 Newcastle.

FOR SALE Realistic TRC 424 AM, quarter wave 'droopy' antenna, 40 feet coax, brand new with instructions $115. Phone Geelong (052) 21 6759.

OMEGA Citizen Band Club welcomes new members. Write to PO Box 267 Guildford, Sydney 2161 for further information.

QSL SAVER NZ send 1-4-1 100% swap anywhere. Trevor PO Box 6043 Palmerston North, North Island, New Zealand.

WANTED URGENTLY manual for Kemtronic CB-500 18ch AM CB or clear photocopy of circuit diagram. Send Peter PO Box 345 Gunnedah 2380.

WANTED Super Panther or Cobra mobile 18 ch good condition around $115 with instructions. Phone Tom (045) 79 6366 after 6 pm.

REALISTIC TRC 448 18ch AM/SSB in very good condition, 12 mths old. Excellent unit $180. Mark Schubert, Macquarie St Coopernook 2426 NSW.

SSB power supply and SWR/mod/RF power meter. Both six mths old, $40 lot. Phone (08) 31 0999.

QSL SWAPS, 5 of yours for ten from my friends. Lakeside 91, Jim Green, Box 114 Toukley NSW 2263.

AUSTRALIAN wishes to QSL and swap stamps with neighbouring states and coutnries. Send BDL 129, PO Box 103, Lamberton NSW 2299.

SOUTHERN KIWI will swap QSL cards 100%. Box 35 Twizel, South Island, New Zealand.

UHF SWR meter new $60, UHF beam 10+ dB gain, new $60. (03) 751 1164 Box 51 Montrose 3765.

TWO CHANNEL expanders for sale 200 channels and 99 channels $40 each. Both unused. Chris, 'Woodville', Wee-Waa 2388, NSW, Australia.

FOR SALE Realistic TRC 448, 54 ch, pre-amp microphone, ¼ wave droppy, power pack. For further details contact Peter (052) 89 1464.

FOR SALE Hygain V, licensed, tuned up, A1 condition. Apply ATC 420 18 Pavy Drive Naracoorte or phone (087) 62 1805 SA.

A MUST FOR DXers
Beam headings (based on the latitude/longitude of your own QTH) to over 350 countries including all American States and Canadian Provinces are now available at a cost of only $7.50.
Great Circle maps can only give a rough beam heading at best – this personal computer listing gives exact short/long path headings plus distance and other information.
Cheque or money for $7.50 to BINT Services, PO Box 323, Cheltenham, 3192, Victoria, (11 Erowal St, Beaumaris, 3193), will have your own beam heading list in your mailbox within a few days.

SALE! THIS ALL MUST BE SOLD AT PRICES MARKED O.N.O.

National Short Wave receiver .500 to 30MHz Sideband and Frequency counter **$220.** Electrophone AM **$35,** Weller Soldering Iron **$10,** Antenna matcher **$10,** Frequency counter, in-Line type **$70,** 22 semi-auto rifle with scope and rounds **$75,** Johnson Viking 4740 for spare parts or repairs **$90, PHONE ME ON (075) 63 1396 OR WRITE TO P.O. BOX 36, BOONAH 4310.**
I also have a mod 02 at $45 and C.B. Actions 13 to 30 except No. 18 V.G.C. and only $7.00.
I also want to swap stamps – Australian for Overseas,

REMEMBER THE ADDRESS: **L. WESTPHAL P.O. BOX 35 BOONAH QLD 4310.**

SHOP N' SWAP

ARE YOU sick of seeing QSL cards that are printed so that any-one can buy them? How about your own personal QSL cards, printed especially for you. Your design! It can be anything, but please print or type in black. Your originals should be clean and tidy, for best results. Design area: 140mm x 85mm please. Normal QSL card information such as: Handle, time etc, will be printed on the back. Send $17.70 to QSL Printers, 152 Tongarra Rd, Albion Park 2527 NSW. In return, you receive 250 personal QSL cards. Money Order or cash only please.

GRANNY WANTS your CB card, Granny Sharp is ninety-eight, Wants it for her album now, Send before you are too late. Granny swaps 1-4-1, 100% returns guaranteed. QSL to Lakeside 35 — Granny Sharp, C/-Box 114, Toukley, NSW 2263

QSL SWAPPERS! If you have Lakeside member's cards in your collection you could possibly qualify for the Club's WALMA Award. Members who also qualify for the Merit Award are presented with 100 Quality QSL cards design No 102 printed with their own name, address and club callsign free of charge. Send 28c stamp for club literature and claim form. Lakeside QSL Club of Australia, P.O. Box 114, Toukley, NSW 2263.

QSL CARD COLLECTOR, Send 5 of yours for five of mine. Lakeside 18 Daryl, P.O. Box 532, Salisbury SA 5108.

AUSTRALIAN RADIO DX club, the National Group for people interested in long distance (DX) shortwave radio reception and monitoring as a hobby. 14 years of national operation with branches in Sydney, Melbourne and Perth. Special introductory fee for people under 18 years of age. For full details write to ARDXC PO Box 79 Narrabean NSW 2101 enclosing a 30c stamp

QSL SWAPPERS send one for one card/s 100% return. Send to MC-62 Philip, 3 Kent St., Sebastapol 3356, Vic.

SWAP QSLs, postcards, maps — anything anywhere airmail international 101% guaranteed return. SPR-25 Chris PO Box 155 Smithfield 2164 NSW.

FOR 101% QSL return card guaranteed send to CR640, PO Box 131, Gosnells, Western Australia 6110.

WANTED Pace walkie talkies 6 channel 5 watts. Phone (059) 68 8736. Ask for Ric.

QSL, His Excellency, Governor, Hong Kong. "Please support legalisation of HKs 40,000 currently unlicensed 27 MHz 40ch/SSB Chinese and fishing folk CB radio stations".

GREAT CB magazines wanted, old or new, swap five different QSL for each magazine. Tom, Box 615 Dickson ACT 2602.

JOIN the Sandcastle QSL Swap Club. Send US$9.50 and 15 cards to Ian Shrader PO Box 167 Pacific Beach, Washington 98571, USA.

FOR SALE GE A3-5825B SSB $120. Choice of 18ch or $30 extra, Mod-02X. Phone (055) 72 2781 after 6.30 pm and ask for Greg.

FOR SALE two FM 320s one modified Tx & Rx plus scanner and 5 dB gain antenna, hardl, used, VGC $200 each urgent Colin VBZ560 (03) 844 2871 Melbourne.

WANTED plans for portable beam to suit car. Send to KD1 Doug P O BOX 181 Nelson Bay 2315 NSW

QSL COLLECTORS swaps 100% please send to WG1155 Peter and Carol PO Box 2006, Wanganui, Nth Island, New Zealand.

QSL SWAP one for one send to WAF39 18 Caroline Ave Southport Queensland Australia.

AERIALS:— 9ft $\frac{1}{4}$ ave whip, 6ft and 3 ft helical whips. All at $8 each ONO. Rod Hunt (02) 528 9476 Oyster Bay.

RUSH 18ch SSB/AM for sale fair condition $100 ONO (03) 509 5370 ask for Bruce. Victoria.

QSL SAVER one for one guaranteed return send to Headshrinker PO Box 44065, Point Chevalier, Auckland, New Zealand.

FOR SALE multi-channel American Electronics SSB complete with 8 cylinder power supply, fully enclosed in Ford F100 mobile radio shack, customised cabinet, luxury seats, fully mobile antenna mast — extendable from 5ft to 5ft 1 inch, DF proof bull bar, radio shack licensed to 1/81, personalised QSL cards (AAP 391), genuine wood tray ground plane, good skip worker (Melb to Syd in 10 hours), consider any offer over $4,000 — offers over $10,000 accepted immediately. Phone Melbourne (03) 568 2618.

ATTENTION QSL swappers, Ken ZL480 will swap 1-4-1 100% guaranteed. QSL to PO Box 31019, Wellington, New Zealand. Extras appreciated TNX.

FOR SALE 11 metre VFO converts a 23ch crystal radio to 40ch with 10kHz slide $60. Phone Brisbane (07) 201 0242.

QSL CARD collectors QSL 100% will swap one for one. Post to Box 135 Kalamand WA 6076. Callsign KR7.

QSL SWAPPER guaranteed 100% return especially Lakeside Radio members. Send to Lakeside 817 Wendy, Box 452, Gawler, SA 5118.

WANTED non-working President Washington base. No more than $20. Write to Neil BR636 PO Box 154, Bridgetown 6255, WA.

X-TAL 10-18 AM/SSB with portable pack. Not a cheap unit. Only portable SSB on the market. 74 Moore St., Campbelltown 2560. All offers considered.

GRAMMOND MARINE AM transceiver, 100w with 6 crystals, built in long wire aerial tuner and broadcast band. Ring (056) 78 5394 Phillip Island, Vic.

QSL CARDS for sale, $6 per hundred, most overseas countries. Write PO Box 67 Hamilton NSW 2303. No personal cheques.

FOR SALE CP1-WM1000 watt/VSWR/modulation meter. Separate meters. As new condition $75 ONO. Phone (02) 661 8316 after hours, Sydney.

QSL CARD collector will swap 1 for 1 or as many as you send. Malcolm McCosh, RSD, Ellerslie, 3265, Vic.

LIKE TO QSL? Join the Adanac (Canada) QSL Club Clearing House. Send SAE to Pacific Lady PO Box 348 Ballina 2478 NSW.

WANTED any information on echo chambers or reverberation units. Will pay good money for useful information. Phone Steve (02) 607 4557.

FOR SALE 18ch President Washington with $\frac{3}{4}$ wave antenna A1 $300 ONO. 5 The Avenue, Corrimal 2518, NSW.

UHF/SWR meter $50, 9 element UHF beam 10+ dB gain $50. Both new. PO BOX 51 Montrose 3765 (03) 751 1164.

advertise free

Readers of CB ACTION may use these classified columns to the extent of 20 words without charge. Each additional word will cost five cents each. Address and telephone numbers are counted as wordage. Two insertions from one person in one issue will be costed as one advertisement. Advertisements will not be considered for the classified page unless they are submitted on the form below, except extra wordage may be continued in block capitals on a separate sheet of paper.

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Every attempt will be made to ensure that all advertisements are included but their inclusion may be dependent on space available.

POST THE COUPON TO: CB ACTION, Age Publications Dept, Box 628E, Melbourne, 3001.

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l Industrial Products, 7 Geonic Street, Woodridge, Queensland 4114.

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Phone (07) 208 8580

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